FOR THE NEWER U.S. COLLECTOR THE EVOLVING HISTORY OF POSTAGE STAMP PRINTING METHODS AND THE PUZZLEMENTS OF TERMS AND ITEMS CREATED BY SUCH

It is probably fair to say that most people start to save stamps because they find that such and such stamp is pretty or interesting. Or they are interested in a topic such as historical events, black heritage, ships, etc. They are very likely to begin by arranging the stamps on a plain piece of paper.

If the person continues much longer, he or she will begin to be tempted to buy a basic album. I started with a worldwide album but have retreated to the United States only.

When starting to put some of the material onto album pages (probably the "prettier" commemoratives first), one will begin to notice some disturbing things. If it is a U.S. album, one will notice that there are tens of spaces for stamps that look essentially alike; Stamps with George Washington's head or that of Franklin. The logical question is why all of those spots for the same thing?

This may lead one to a catalog. Catalogs will help with estimated market values as well as detailed descriptions of various stamps. The basic information that will be found will be date of issue, color, die type, etc. The more detailed the catalog the more ETCETERA one will find.

However, it is probably fair to say that there are four main culprits that create the need for those spaces of the same looking stamps.

1) Paper: Types, Grills, and Watermarks
2) Types created by dies, transfers, etc.
3) Printing methods: Flat Plate, Rotary, Offset, Modern
4) Perforations

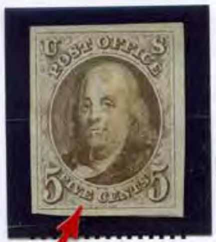
It is some of the above plus the ETCETERA that may assist a newer collector. Most of these were points or terms that I pondered over, while learning the limited amount I know today.

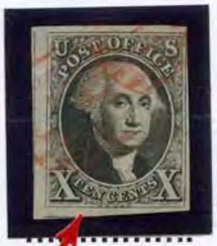
PAPERS: EARLY PRINTING COMPANIES

Changes in printing companies had an influence **(in some cases)** on two of the four main differences listed on the previous page: papers and perforations.

Initially the post office contracted with outside printers.

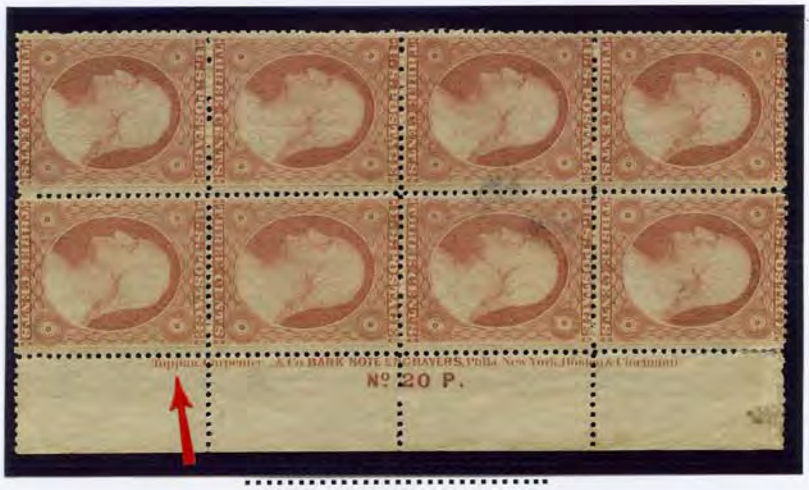
For the first two issues in 1847 the government used the firm of Rawdon, Wright, Hatch & Edson (non perforated)





Looking closely at the bottom of the stamps there are the Initials, RWHE **of Rawdon, Wright, Hatch, & Edson.**

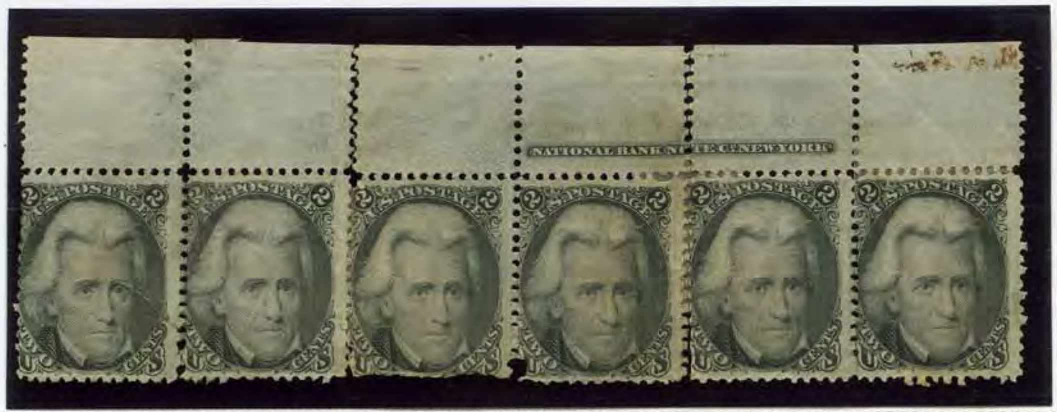
Toppan, Carpenter, Casilear & Co:
Printed the imperforated issues of 1851-1857 and the perforated issues of 1857-1861).


Toppan Carpenter & Co BANK NOTE ENGRAVERS, Phila New York, Boston & Cincinnati
Nº 20 P.

Toppan Carpenter & Co. Bank Note Engravers Phil. NY, Boston, Cincinnati

National Bank Note Co:

In 1861 Montgomery Blair, the Postmaster General appointed by Abraham Lincoln, determined that stamp production should be put up for bid and the National Bank Note Company submitted the lowest bid. National printed the stamps from 1862 through 1871, including all of the "grilled" issues.

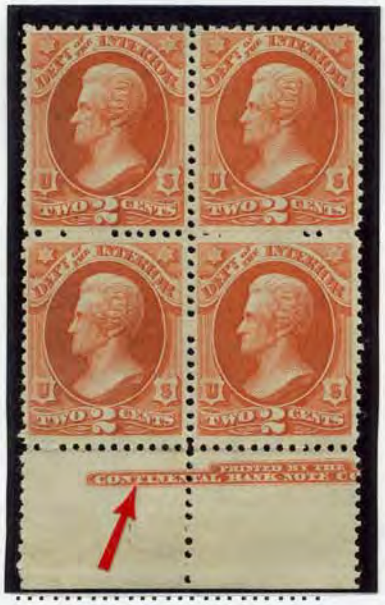


1861-66 2c Andrew Jackson

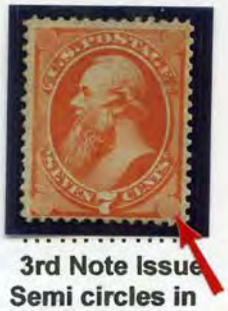
Continental Bank Note Co:

The Continental Bank Note Co. produced the next stamps, the Third Bank Note issue (1872 through 1875), the issue with the "secret" marks and next two stamps, the Andrew Jackson and Zachary Taylor stamps.

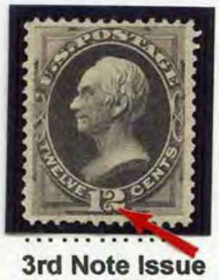
Example of some "secret marks"



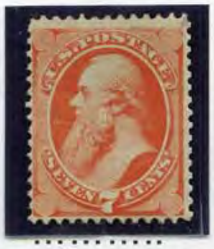
Andrew Jackson



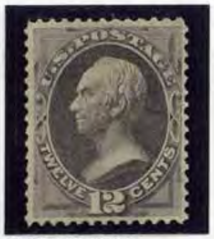
3rd Note Issue
Semi circles in ball of right hand corner



3rd Note Issue
Balls of figure "2" are crescent shape



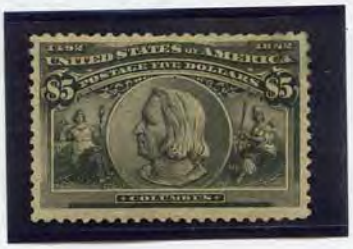
2nd Note Issue

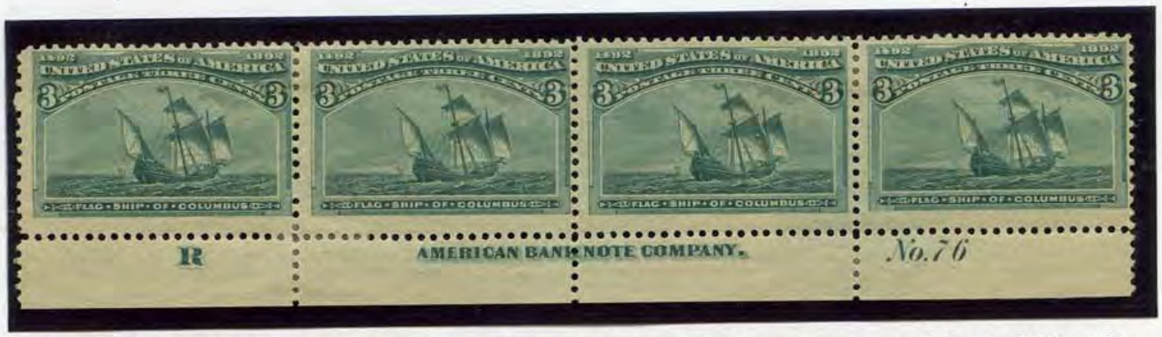


2nd Note Issue

American Bank Note Co:

The Continental Bank Note Co. was consolidated with the American Bank Note Co. in 1879 and American printed the last of the Bank Note issues and the issues of the1880s and the Columbian Issues of 1893





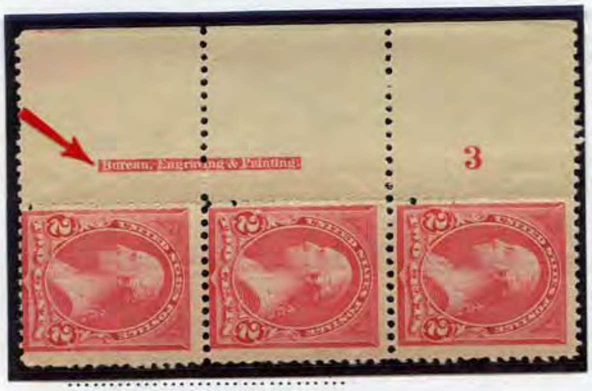
In 1906 the American Bank Note was the low bidder on a new stamp and thought that it was back printing stamps for the Bureau after 12 years. However, the Postmaster General decided not to use American and continued to print stamps within the Bureau.

U.S. Bureau of Engraving & Printing:

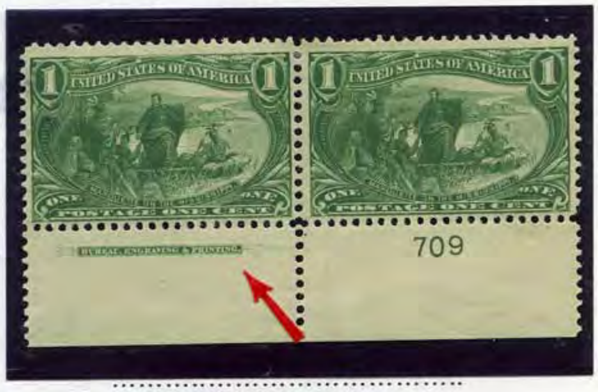
The Bureau of Engraving & Printing began printing stamps in house in 1894. Various bureau margin imprints were used until 1910.

Types I, II, IV, and V occur on regular postage issues. Types III, VI, and VII occur only on the Special Delivery plates. Type VIII on the Trans Mississippi issue.

Examples of a few Bureau of Engraving & Printing Imprints

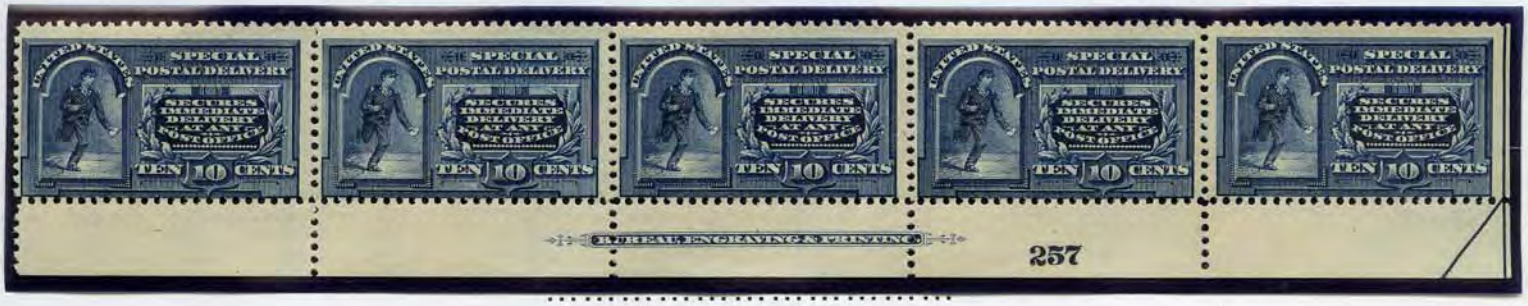


Type I Imprint
Second Bureau Issue



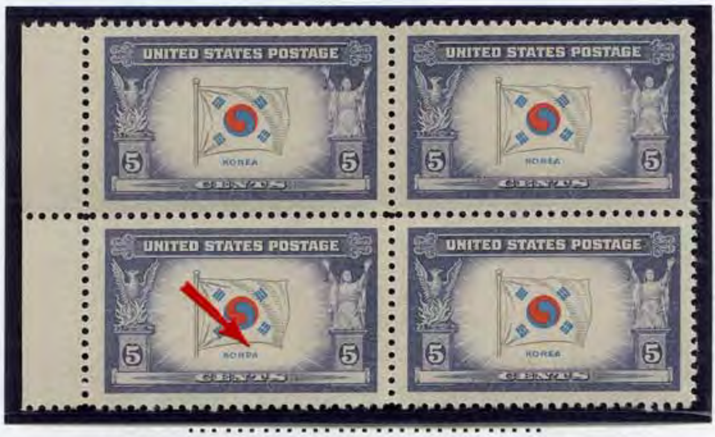
Type VIII Imprint
Trans Mississippi Issue

U.S. Engraving & Printing Imprints cont.


SPECIAL POSTAL DELIVERY
SECURES IMMEDIATE DELIVERY AT ANY POST OFFICE
TEN 10 CENTS
BUREAU ENGRAVING & PRINTING
257

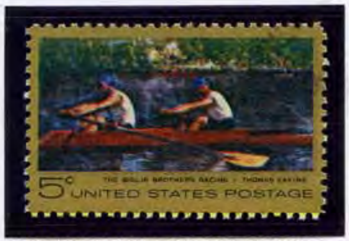
Type VI
1895 Special Delivery Issue, Dwk

From 1894 the Bureau printed all stamps in house until 1967, with the exception of the Overrun Countries Issue of 1943-44.



(this block has the "KORPA" error)

In 1967 the Bureau used the firm of Photogravure & Color Co. of Moonachie, N.J. to print, The Thomas Eakins Issue. The next use of a private printing company was in 1979 for the John Paul Jones issue. More will be said about that issue later.



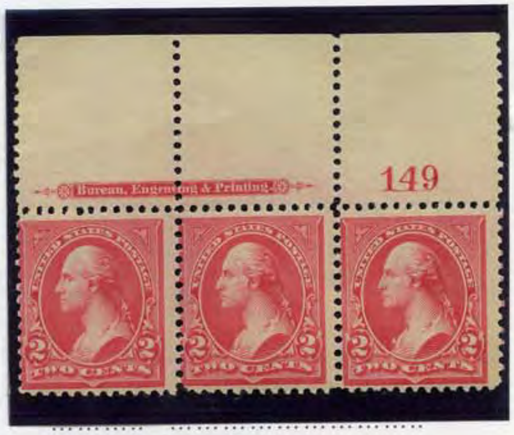
The Bureau then used the American Bank Note Co. and J.W. Fergusson & Sons along with their printings until the beginning of the 1990s. Since then a number of companies have been used.

U.S. Bureau of Engraving & Printing

The Bureau of Engraving & Printing began printing stamps in house in 1894. Various bureau margin imprints were used until 1910.

Types I, II, IV, and V occur on regular postage issues. Types III, VI, and VII occur only on the Special Delivery plates. Type VIII on the Trans Mississippi issue.

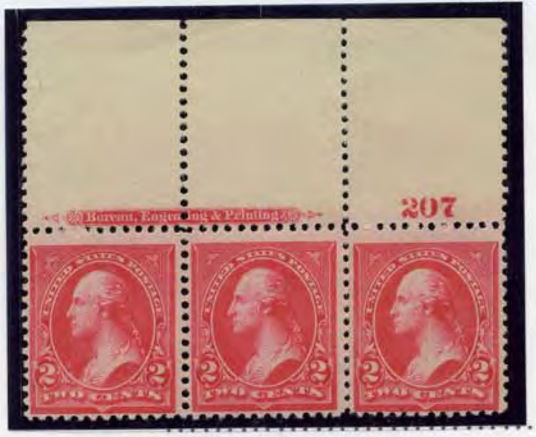
Bureau of Engraving & Printing Imprints



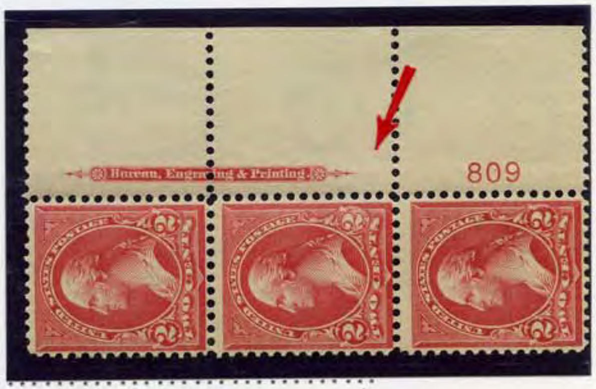
Type I Imprint

Type II Imprint

Second Bureau Issues



Type IV Imprint



Type V Imprint

Second Bureau Issues

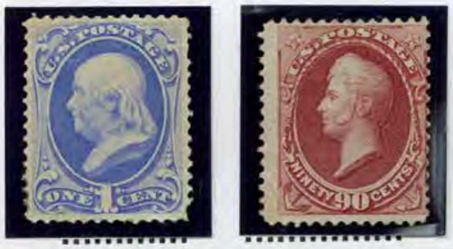
Type VIII
Imprint
Trans Mississippi
Issue

TYPES OF PAPER

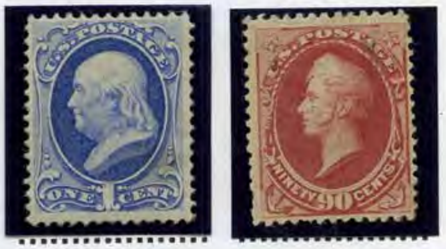
In the earlier years there was considerable experimentation with types of papers. Two basic types are described, “wove” and “laid” papers, the principal difference being created by the wire mesh that is used in the manufacturing process. Proofs and essays will not be demonstrated, but these were sometimes produced on “India” paper.

BANK NOTE ISSUES

The “Bank Note” issues between 1870 and 1873, the first two issues, were printed on “white wove paper, thin to medium thick”. The difference being that the first issue was “grilled”, and the Second Bank Note issue was not. Both were printed by the National Bank Note Company. The Third Bank Note issue was printed by the Continental Bank Note Co. The Fourth Bank Note issue, printed in 1879, was printed on “soft, porous paper” and produced by the American Bank Note Co.



Second Bank Note Issue
Printed by National Bank Note
on
wove paper, thin to medium thick



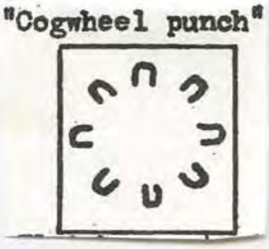
Fourth Bank Note Issue
Printed by American Bank Note
on
soft, porous paper

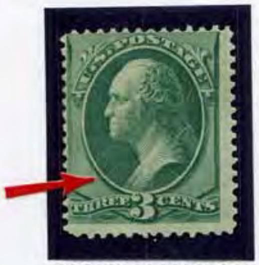
This latter issue, the Fourth Bank Note issue on “soft, porous paper” presents some challenges in distinguishing it from the Second Bank Note issue.

EXPERIMENTAL PAPERS

Fletcher Patent

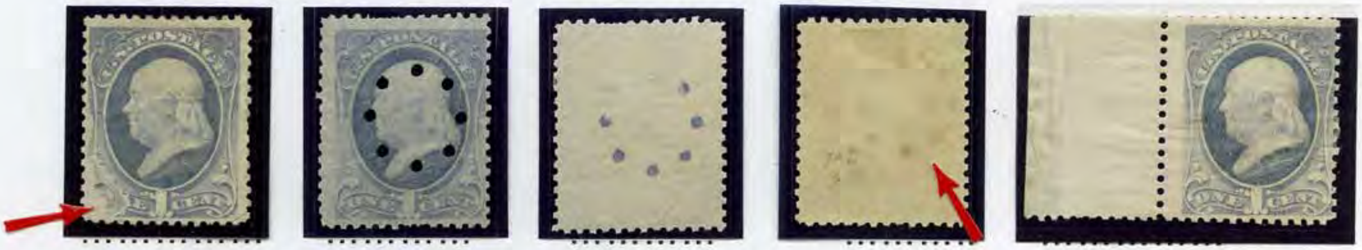
In June 1869 a patent was issued to C. A. Fletcher in which stamps **(with two layers of paper)** were cut with 8 “U” shaped punches **(on the lower layer)**, so arranged that they appeared to look like a cogwheel. The Continental Bank Note Company issued the stamps in 1873. This was done to prevent the stamps from being reused, as it prevented the ink from being washed off of a used stamp.





1873 Issue

Douglas Patent



1881-82 Issue

Note upper paper fold over in left bottom corner

upper paper

lower paper

back complete stamp

front of stamp

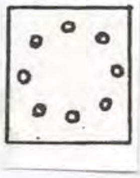
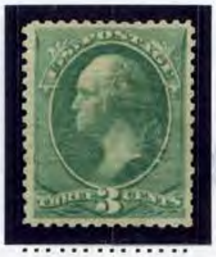


Illustration of 8 punched holes

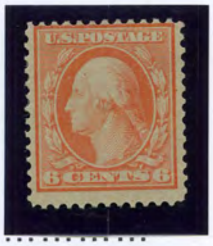


3c 1881/82 Issue

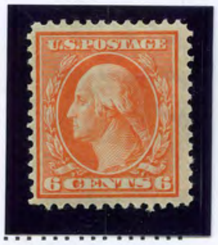
The stamps of the 1881-82 issue were composed of two layers of paper; the upper layer being very thin. The upper layer was punched with eight small holes, which formed a circle. These experimental printings were ordered from the American Bank Note Co. and sold through the Washington Post Office. The purpose was the same as the Fletcher Patent

BLUISH PAPER

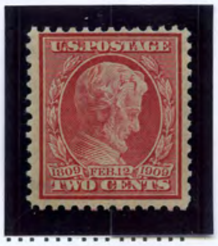
Bluish Paper



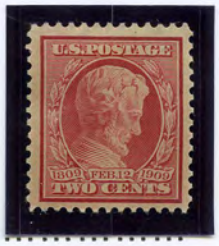
Regular Paper



Bluish Paper



Regular

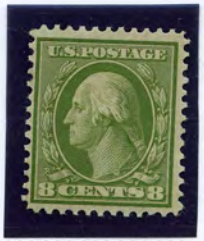


The “Washington/Franklin” issue of 1909 had separate catalog numbers for the stamps printed on regular paper and those on “bluish paper”.

In addition to this issue, the Lincoln Memorial issue was printed on both types of paper.

The Bureau experimented with this new type of paper in an attempt to eliminate the irregular shrinkage in the paper that occurred in the wetting process as this produced “off center” stamps when perforated. (This subject will be discussed again later). The paper contained one third “rag stock”.

CHINA CLAY



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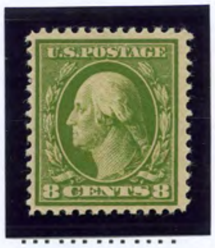
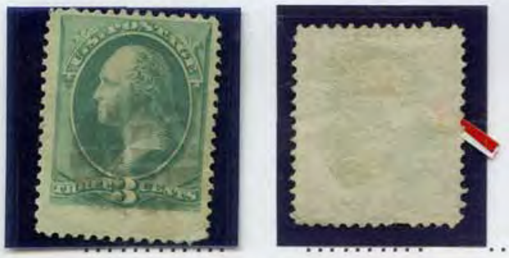
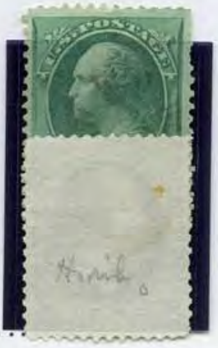


Regular Paper

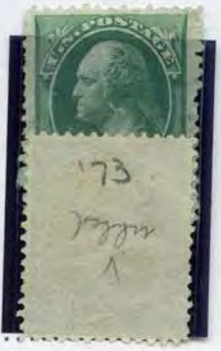
A limited quantity of stamps were issued in 1908-09 on “China Clay” paper. These papers appear thick and grayish, somewhat darker than the “bluish” paper. This difference is caused by the fact that a higher mineral content, aluminum silicate, was used. Again the experiment was tried to reduce the shrinkage of paper during the wetting process.



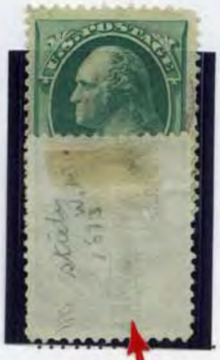
Regular
Double paper



Horizontal
Ribbed paper



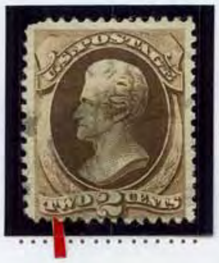
Vertical
Ribbed paper



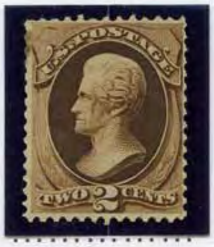
Stitch
Watermark

1873 Issue

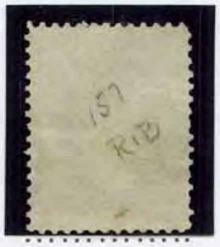
Stitch watermarks show a row of short lines created in the paper pulp making process.



Another example
of double paper

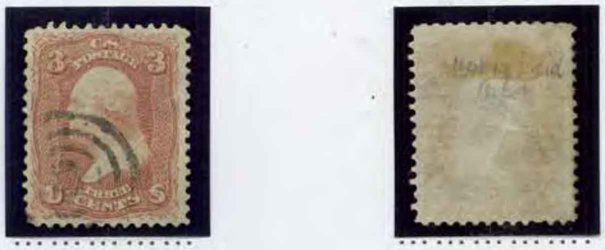


1873 Issue
Jackson
Continental Printing Co.



Another Example
of Ribbed Paper

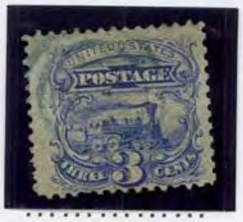
Laid Paper Variety: In the paper making process, wire cloth is formed of closely spaced parallel wires crossed by wider intervals of crossed wires. Therefore, the paper shows alternative light and dark lines.



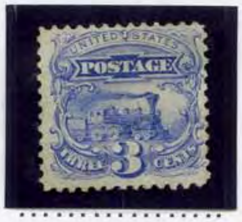
1861/62 Issue

Grey Paper usage on 1869 Pictorial Issue

The 3c issue was the only one of the series that had a limited amount of stamps printed on the "grey paper".



Grey Paper

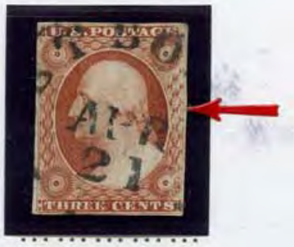


Regular Paper

1852 Issue showing color variation as a result of Paper Drying Differences on the outer margins.

It can be noted that the printing ink is lighter on the right side of the stamp, as the dampened sheet dried out on the edge before the printing.

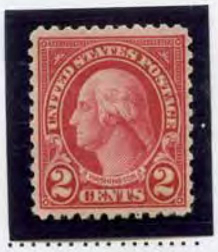
The subject of paper drying differences will be discussed in a later section, particularly as it relates to perforation inconsistencies.



1851-57 Issue: Position 90R2L

Some modern examples of experimental papers are

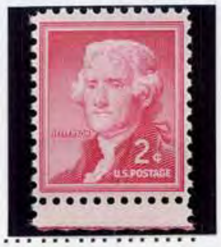
4th Bureau Issue: (2c Perf 11x10 1/2) The Bureau experimented with a thin rough paper. As can be noted from the example, this paper can be detected as the front impression is clearly visible from the backside.



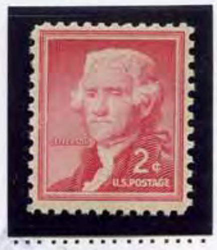
thin rough paper

regular

The Liberty Series of 1954 produced experimental paper on the 2c Washington. A "silkote" paper was used on a limited number of printings (50,000). The stamps were placed on sale in Westbrook, Maine in December 1954.



Silkote Paper
PF 0341261



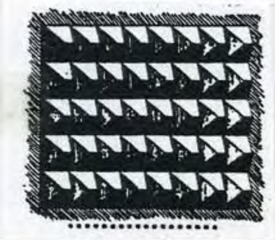
Regular

GRILLS

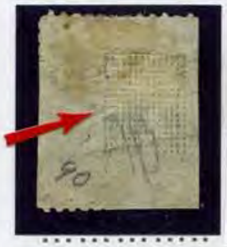
Some of the earlier issues were produced with grills. The concept: If the fiber of the paper was broken, the ink would soak into the stamp, so that the cancellation ink could not be washed off the stamp for re-usage. Grills were used from 1867 through 1871 and produced by the National Banknote Company. **(There is some debate as to whether the Continental Bank Note Co. produced grilled stamps. If so, they were in limited numbers)**

Differences in grills break down into two categories

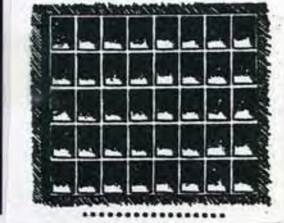
1) The honey comb gill that pressed the paper up, to create upward looking pyramidal pits.
2) The second type used a cylinder that pressed the paper down.



C Grill 13x16mm



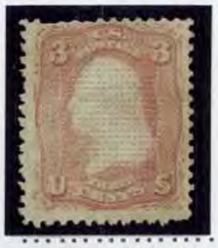
E Grill 11x13mm



Pressing the paper
Up

Pressing the paper
Down

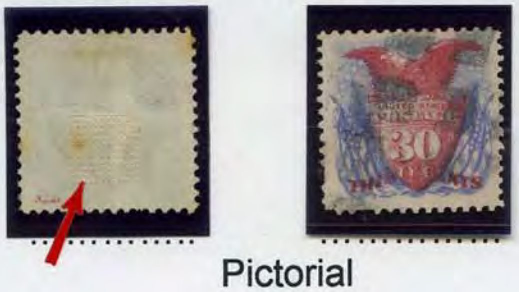
The other difference in grills is the size of the grill. On the first cataloged grill the entire stamp was covered. After that issue the size of the grills were reduced because the larger grills weakened the paper.



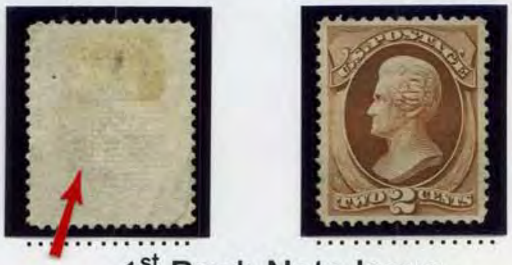
Entire Stamp covered by grill

E Grill 11x13mm

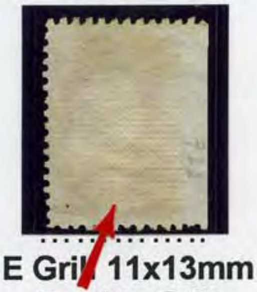
Other grills varied in size from: 18x15 mm, 13x16 mm, 12x14 mm, 9x13 mm, 9.5x9 mm, 10x12 mm.



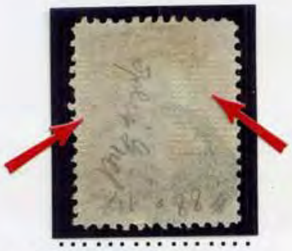
Pictorial



1st Bank Note Issue



E Grill 11x13mm
Double Grill



E Grill 11x13mm
Split Grill

Probably both were created by an improper paper feed, as one person controlled the grill while another fed in the paper. A split grill could have been caused by the improper alignment of the paper. A double grill may have been caused as the grilling process was started and then the paper taken out to be properly aligned and the grilling process restarted.

……

The stamp below is an anomaly. It looks to have a grill on the back. That is not true. It has "remnants of a Leed's Patent Envelope adhering".

1861-2 Issue
Certification # A41744

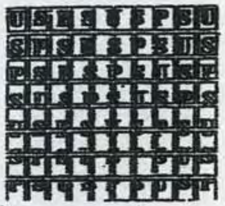
WATERMARKS

The first use of watermarked paper was for the 1895 Third Bureau Issue. It was determined that using watermarked paper was more practical than using grills. Actually, the two processes were intended for slightly different purposes as grills were implemented to discourage the reuse of stamps. Watermarked papers were implemented to discourage the counterfeiting of stamps (demonstrated later). The use of watermarked paper lasted on regular issues until 1917.

Two basic types of watermarks were used. The initials of U S P S were used in both cases

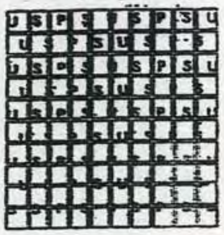
Double Line

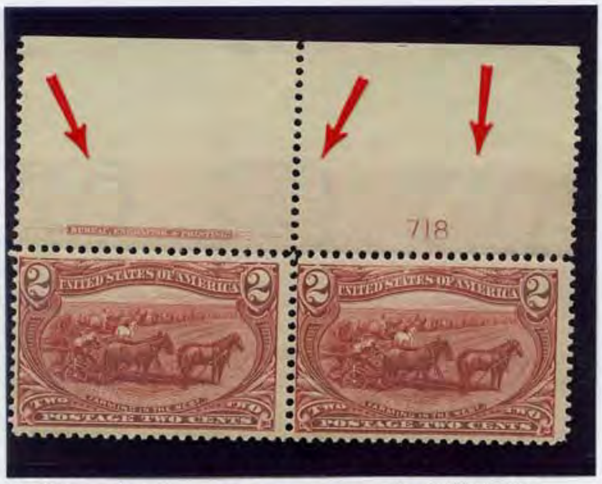
"P"



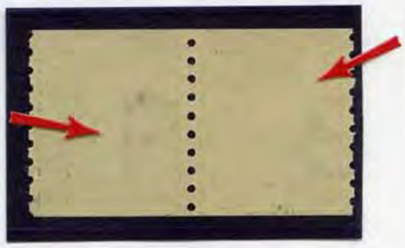
Single Line

"S"





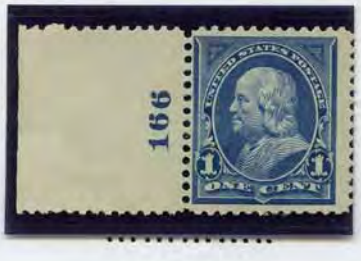
In the selvege you can see part of "S U S" Or the "S" of Service and then the "US" of United States

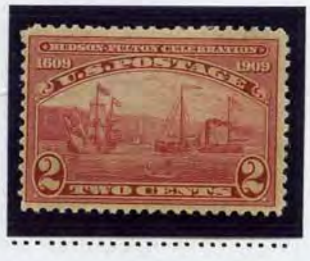


The "P" and "S" of 1910/11 perf 12 1c Franklin Issue

Double Line watermark: 1895-1909. Used on the Third Bureau Issue, through the Hudson-Fulton Celebration.

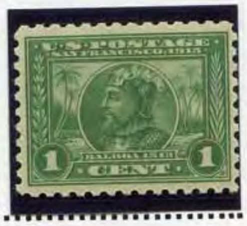
1c Third Bureau Issue



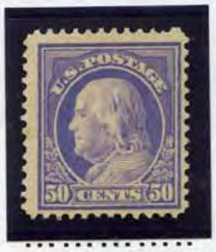


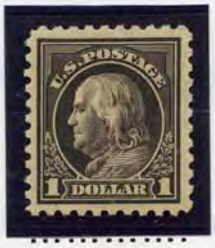
WATERMARKS CONT'

Single Line watermark: 1910 through 1916. Associated with the Washington/Franklin Issues, but including the Panama/Pacific Exposition Issue.

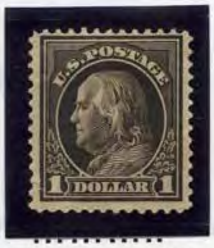


That would be easy except there are exceptions:





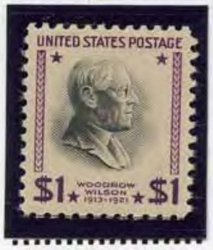
The 50c & $1.00 Issues
Double Line, issued in 1912

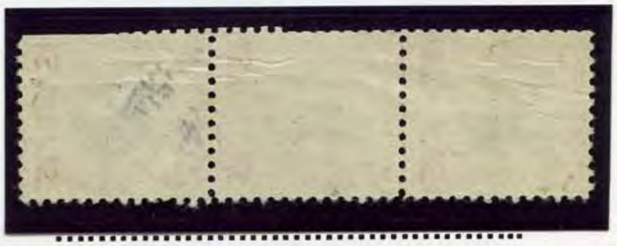


$1.00 issue 1915
Double Line

A 2c perf 11 Washington issue was printed on left over double line paper as late as 1917.

Watermark Errors (in reality, these are not watermark errors but stamps printed on incorrect papers). For regular issues the Postal Service used the watermark of USPS (US Postal Service) and for revenue issues USIR (US Internal Revenue)





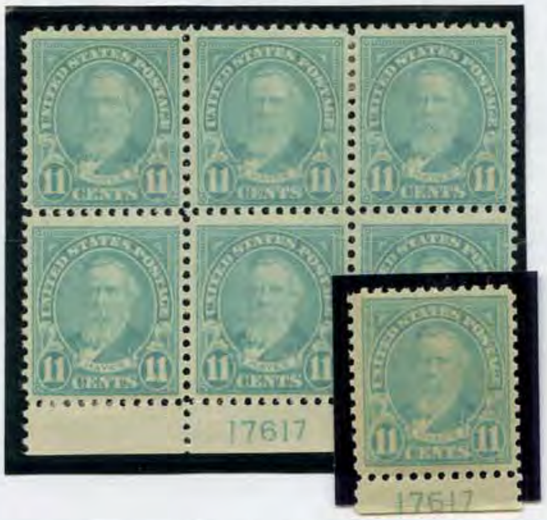
The $1.00 Presidential Series stamp was discovered on USIR paper on certain plates.

GRAIN OF PAPER

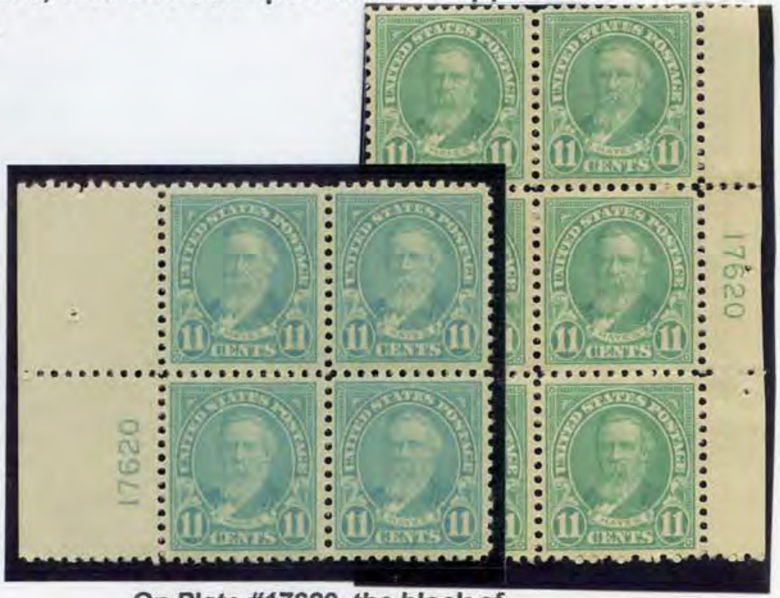
creates minor size differences in select issues

Prior to and up to 1926, the Bureau ordered paper with the grain horizontal instead of vertical for booklet material. Paper shrinkage is greater across the grain, and the Bureau needed the horizontal spacings to be consistent for booklet assembly. Flat plate booklet production ended in 1926 leaving the Bureau with horizontal paper stock. In 1928 this left over stock was used on some of the flat plate 1922-26 4th Bureau Issues. 11c, 12c, 15c, 20c, 25c, and 30c issues, as well as some of the 5c airmail of 1928, and the 15c special delivery of that year.

The vertical stamps on the horizontal paper (Post Office Paper Special - POPS) were slightly wider and shorter than the ones printed on vertical paper. The differences on the 20c, 25c, and 30c stamps were the opposite as they were printed on their sides.

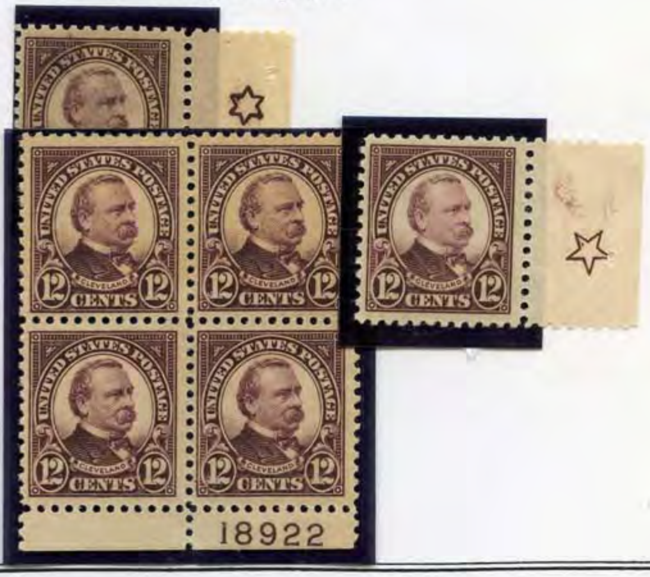


Demonstrates paper differences on the same plate # 17617. The single is on POPS & the block on regular paper. POPS being slightly wider and shorter.



On Plate #17620, the block of six is on POPS and the block of four on regular paper

The block of 4 is on POPS and the two "star" singles are on regular paper. Both being taller and narrower than the POPS stamps



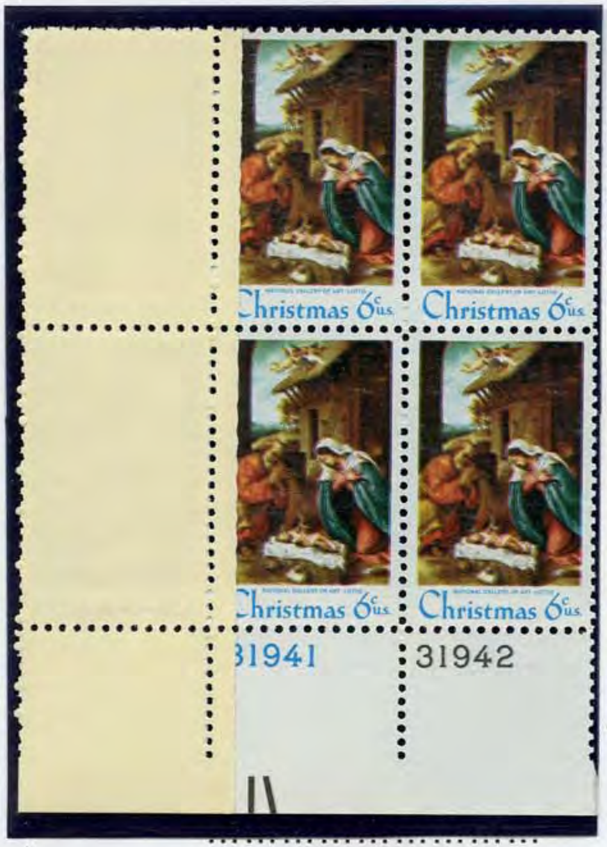
MODERN DIFFERENCES OF PAPER

PAPER DIFFERENCES:

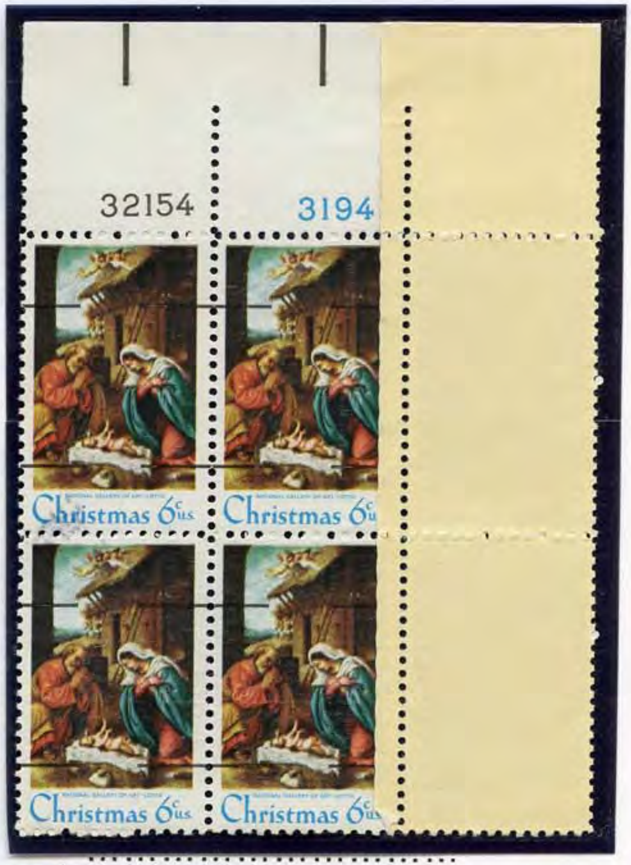
Christmas Issue of 1970

The Bureau ordered new presses from Italy that used the Andreotti photogravure process. However, the Bureau contracted with Guilford Gravure, as a backup to print the stamps, if the presses did not arrive on time. This, in fact, is what happened. The first paper used was a gummed gravure paper with a smooth finish. However, later it was determined that additional quantities were needed and, because of a shortage of the original paper, a creamy un-gummed gravure paper was used for printings.

It is also interesting to note that on the original paper the image is somewhat blurred. The design on the second paper is much more focused.



Original Paper

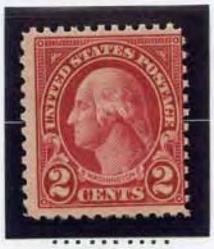


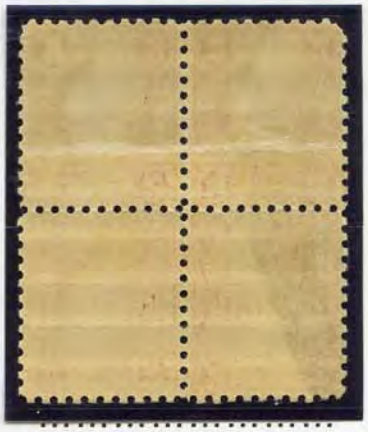
Second Edition

DOUBLED PAPER ERRORS

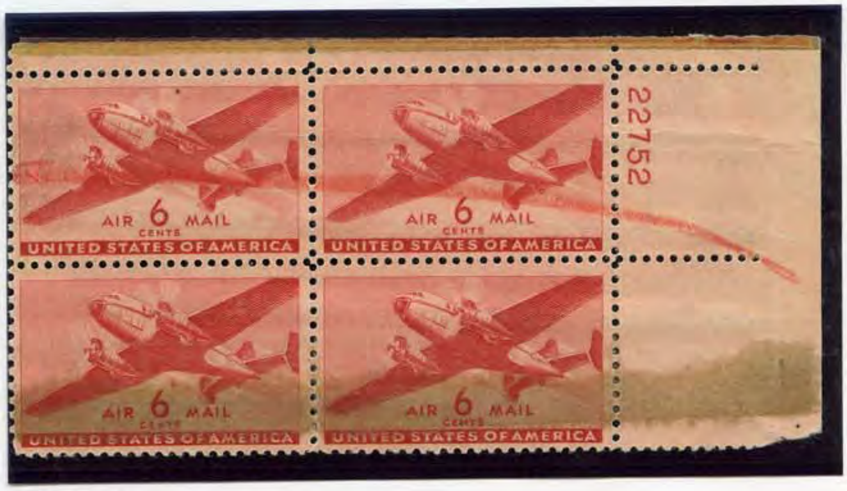
The following examples are on doubled paper, which was usually the result of two webs of paper being spliced together in the rotary printing process. These irregularities were usually caught in the inspection process and disposed.

1923/6 2c perf 10



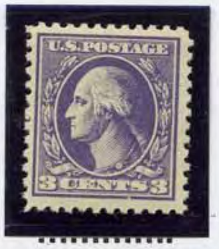


1941/44 6c Airmail
Uwmk; perf 11x10.5

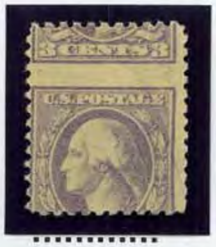


PRINTED ON BOTH SIDES

This 1918 Offset 3c Washington was printed on both sides.



Front Appearance



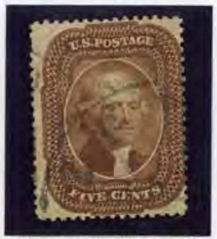
TYPES: DIE, RELIEF TRANSPERS, AND RE-CUT DIFFERENCES

Although many stamps look very much alike they are listed as different Types. For the first hundred years virtually all stamps were produced through the engraving process (exceptions the offset series). As a result, the catalog will point out type differences. These differences can occur for a number of reasons: Trimming of the relief on the transfer roll, or insufficiently rocking the entire relief image onto, or from, the transfer roll, or perhaps re-cutting of the design directly on the plate. The differences are so great that only a few examples will be demonstrated. Even these descriptions will make the experts cringe, because of there superficiality.

The Thomas Jefferson issue of 1857-61 is a good reference for two differences. Re-Cut reliefs and Color

getting cut

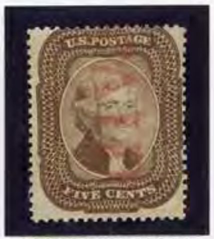
Brick Red



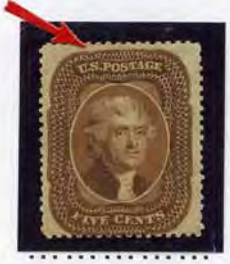
Red Brown

RC

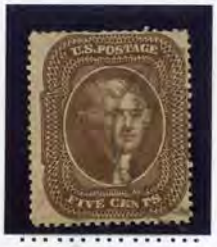
Indian Red
Certified: PF 62 432



Brown



Orange Brown

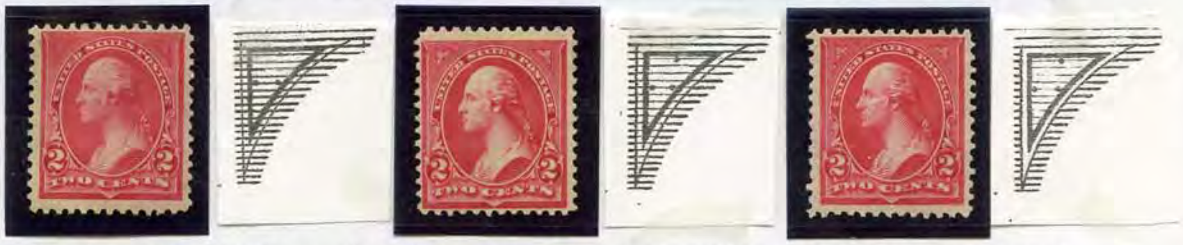


Brown

The reliefs of the top four differ from those of the bottom two, as the top and bottom projections are partially cut away.

Color Differences: In the case of these issues the catalog lists the stamps under separate numbers because of color differences. It will be noted later, color differences do not always warrant separate catalog numbers.

1894 First Bureau Issue: 2c Triangle Frame Line Varieties



On first observation the three stamps look alike. However, there are differences in the upper left hand framing triangle. Note that in the first the horizontal background lines are the same thickness throughout the design.

The center stamp has lines running through the entire background but the lines within the background are thinner than the lines outside of the triangle.

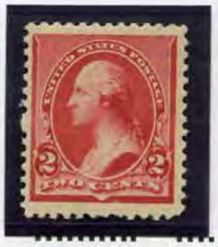
The right hand stamp has the thinner lines within the triangle but note that the lines do not cross the framing line of the triangle.

……

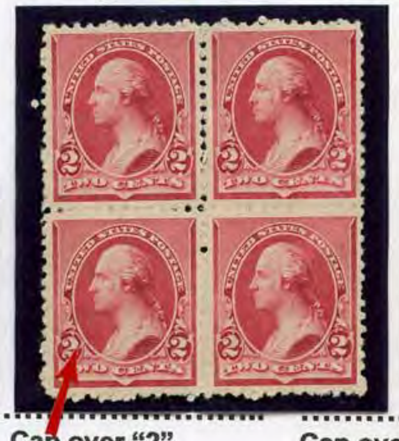
Varieties that are created by plate usage wear:

1888 2c 1st Bureau Issue

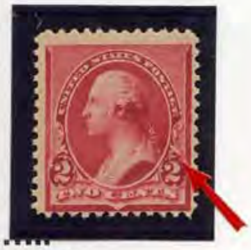
The "caps" were created by deterioration of the metal on the transfer roll



Regular



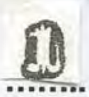
Cap over "2"

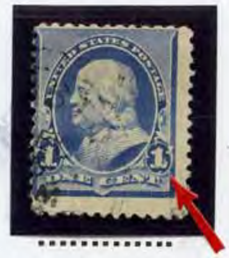


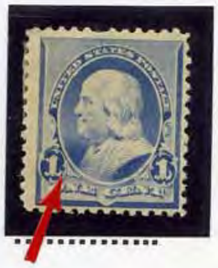
Cap over Both

1890 Issue
1c "Candle Flame" Variety

Printing variety caused by the wiping process removing too much ink from this portion of the plate due to too heavy pressure on the wiping roller.







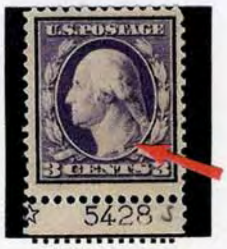
There will be more on Types: Die, Transfers and Re-Cuts under the sections on Printing Methods-Rotary Press and "Affects of World War I on Stamp Production"

Die Type created due to corrosive inks during the War :

The corrosion of plates because of inferior inks produced another Die Type of the 3c Washington (Jan. 1918)

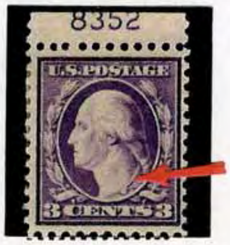
Type I Used on both Flat Plate & Rotary Plate

- **a) the top line of the toga rope is weak and the shading lines thin**
- **b) 5th line from the toga crosshatching is missing**
- **c) line between the lips is thin**

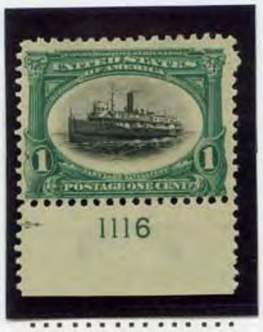


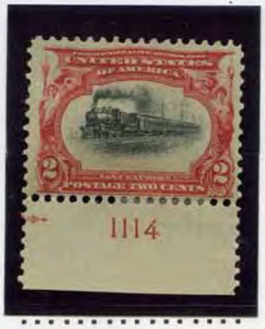
Type II Used on both Flat Plate & Rotary Plate

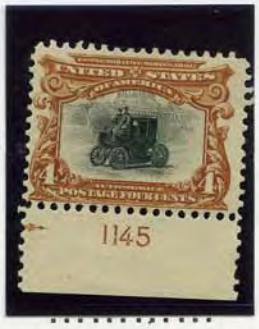
- **a) top line of the toga rope is strong**
- **b) line between the lips is heavy**



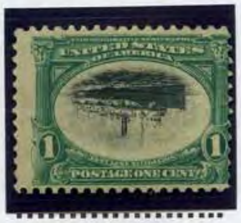
PLATING ERRORS: PAN AMERICAN EXPOSITION ISSUE OF 1901





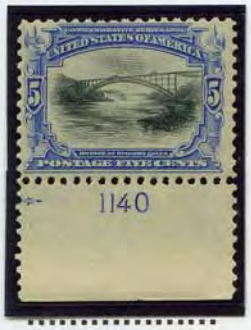


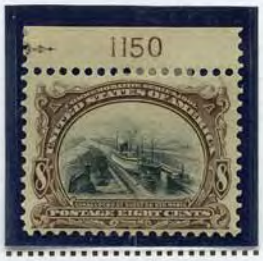
RC

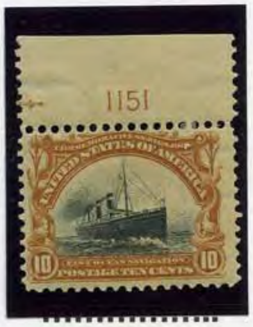


PF 0255064

In creating multiple color stamps in the early years, stamps were printed from two plates; One being the frame and the other the center vignette. In some issues of the Pan American series (1c issue, 2c issue, and 4c issue) the frame was inadvertently inverted.

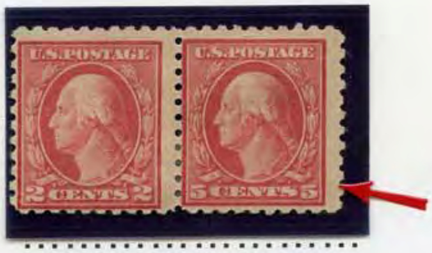




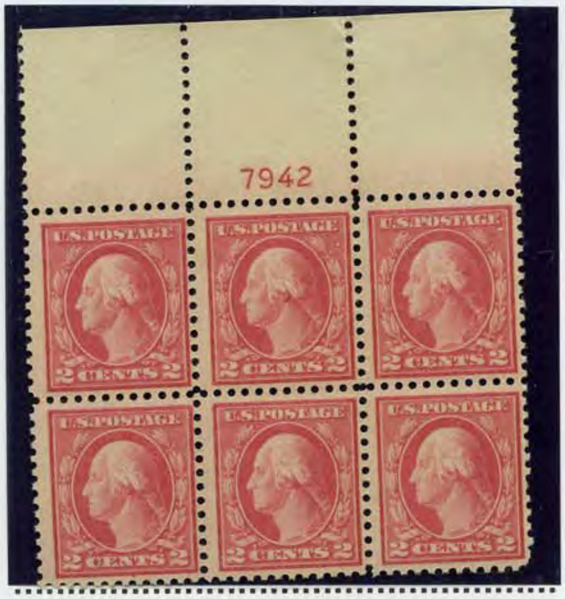


PLATING ERRORS ON THE 2C WASHINGTON ISSUE

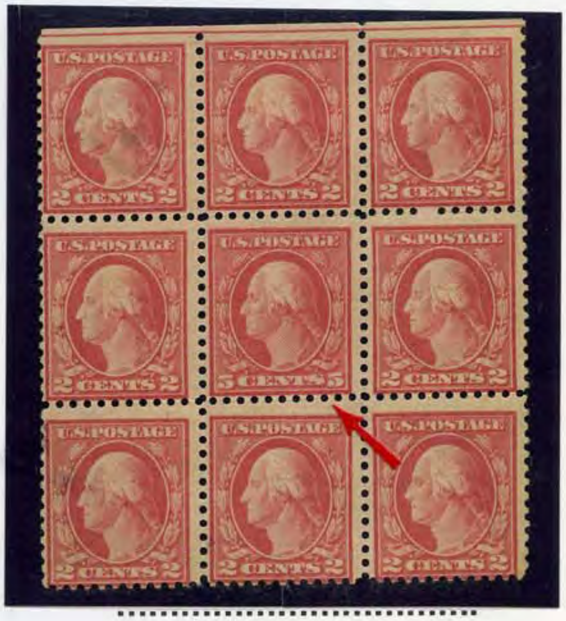
In preparing the plates for the 2c Washington in 1917, a 5c transfer roll was inadvertently used. On one plate this happened on one impression and on another plate on two impressions. These plates were perforated in two forms; Perforation 10 and perforation 11. In one account this error was blamed on the pressures under which the workers labored during World War I. Was that the case, or was it the aftermath of the night before ?



Perforated 10

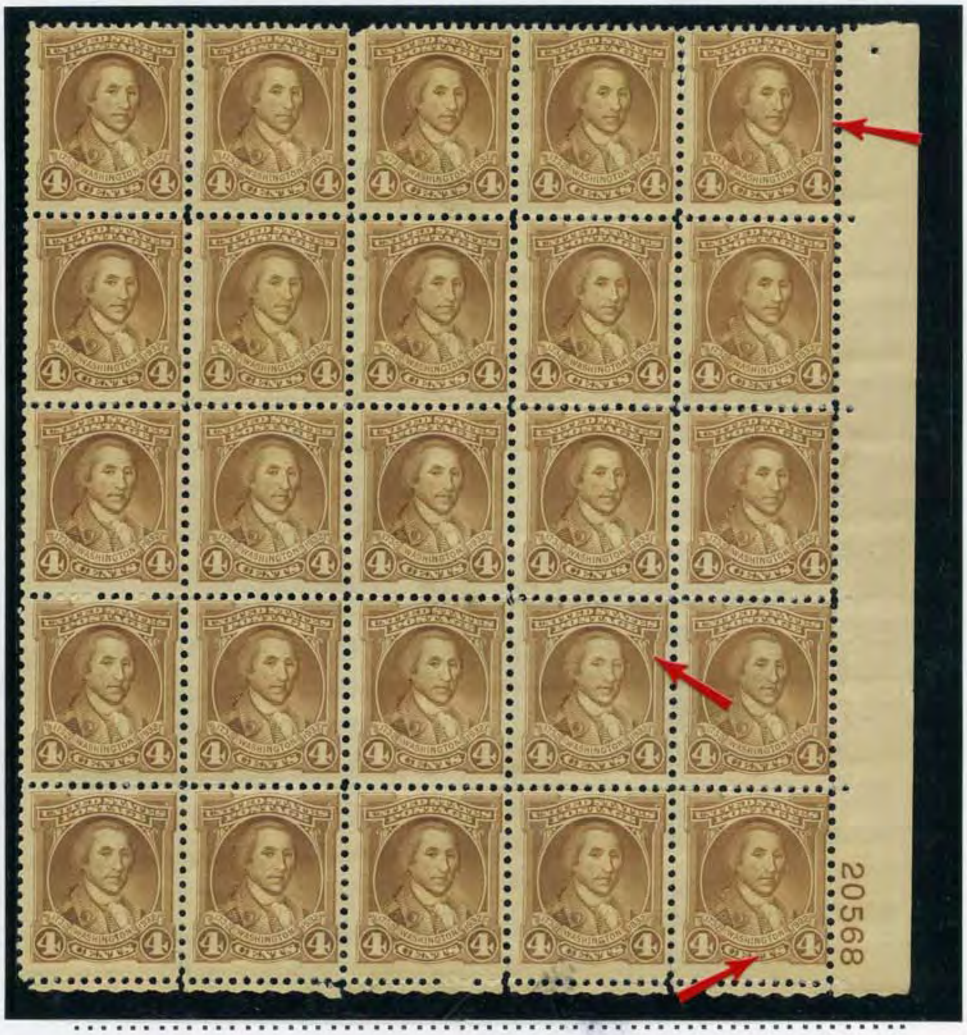


Error produced from Plate #7942



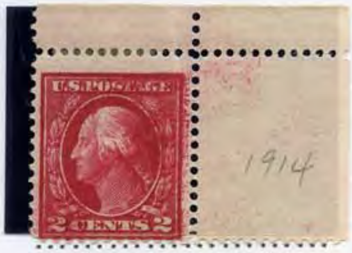
Perforated 11
Lower Right Pane

PLATE VARIETIES ON THE 4C 1932
Washington Bicentennial Issue



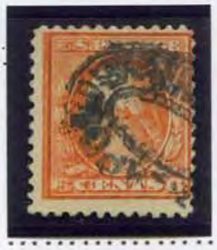
a) Double Transfer L.R. position 60
b) Retouch in eye L.R. position 89
c) Broken bottom frame line L.R. position 100

TRANSFER/PRINTING ERRORS



1912 Swmk
Perf 12 type I

Shifted Transfer



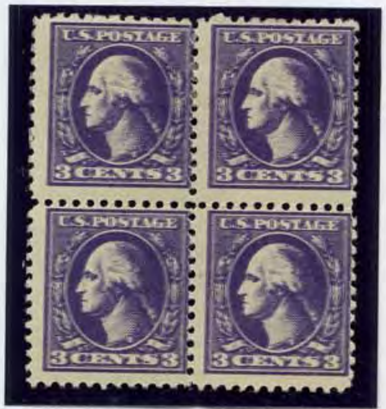
1917 Unwmk
Perf II

Double "kiss" Impression
Certification PSE 10623

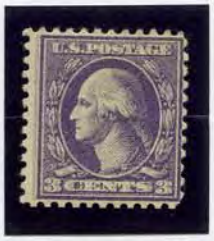
A "kiss" is caused by the removing of a sheet from the press in a careless manner and a portion comes in contact with the plate a second time.

Double Print

1918 Unwmk
Perf II type IV
In 1918 the foreman was quoted as saying "As a matter of fact we were working under pressure……and found that the sheets were coming through so lightly inked that you could not even see an impression on it. I then told the boys "don't waste that paper, stick them in and run them through again.



Visible on right side



Visible on "3c"
& left margin

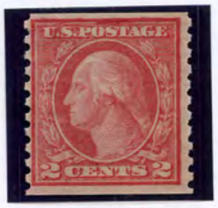
PRINTING METHODS

Flat Plate Printing

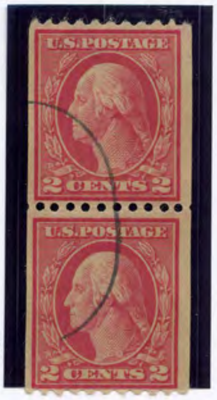
Rotary Press Printing

Flat Plate Press was initially used for printing all stamps. However, the production of coil stamps used in vending machines (begun in the early 1900s), presented problems as the process was laborious. A superior solution was found with the development of the Rotary Printing Press. First developed in 1910 but first production waited until 1914.

1st vertical coil
Type I Perf 10
Issued 1914
Swmk



1st horizontal
TypeI Perf 10
PF 42140
Smk, 1915



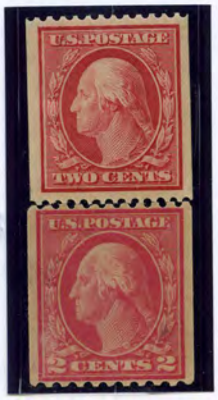
Rotary Press and Flat Plate created numerous Scott listings in the Washington/Franklin issues. *Size of the stamps; Term differences between Flat Plate and Rotary; Die differences*

Size differences: discernable differences for the collector

Because of the curved nature of the plates on the rotary press cylinders, the rotary impressions are somewhat larger. Flat Plate stamps measure 18 ½ -11 mm wide and 22 mm high. Rotary stamps placed sidewise on the curved plates measure 19 ½ -20 mm wide. Stamps that are vertical measure 22 ½ -23 mm.

Below are examples of this difference:

The bottom stamp is a rotary and is slightly wider than the flat plate stamp



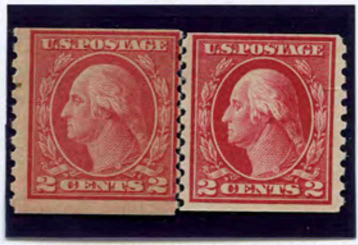
1910 Issue
Perf 12
Flat Plate

Type I, 1915
Rotary Press
Certification
PF 90 231

Type 1, 1914
Flat Plate
Perf 10 Swmk.

The stamp on the left is a rotary stamp and is slightly taller

Type III,1917
Rotary Press
Perf 10 Uwmk

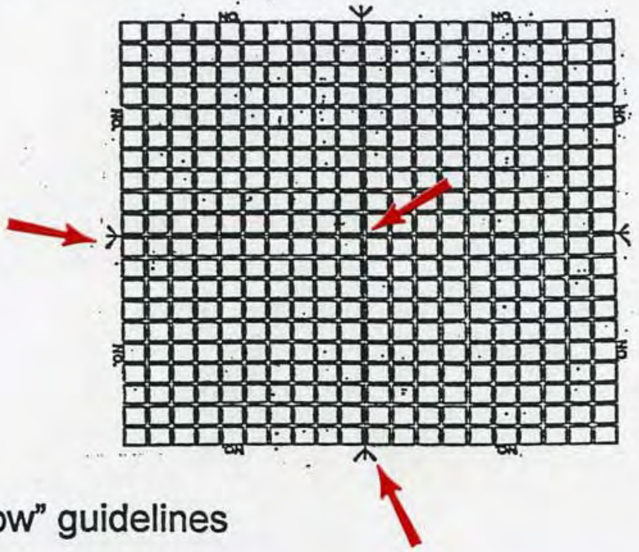


FLAT PLATE PRINTING:

Terms used in conjunction
with Flat Plate Printing

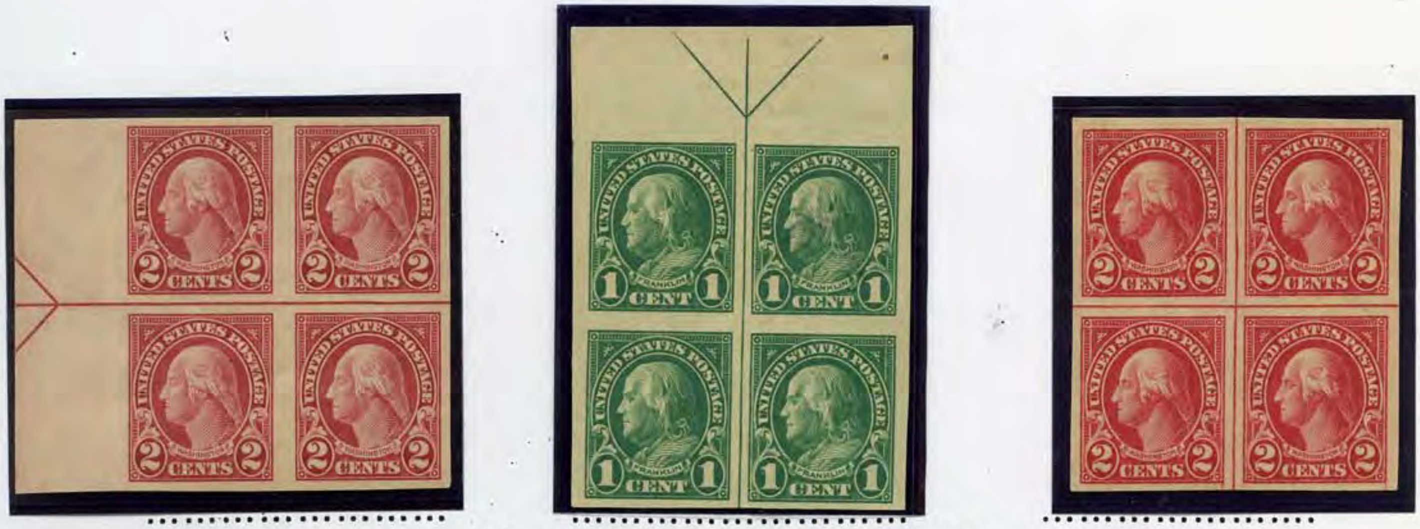
Plate Varieties: Star Plates
"A" Plates
Coil Plates

Below is an example of a sheet of 400 stamps. The "guide line" markings, that were used to help the printers align the sheets, should be noted, as this will assist in understanding some of the following terms.



Margin "arrow" guidelines

Center sheet
Guide line

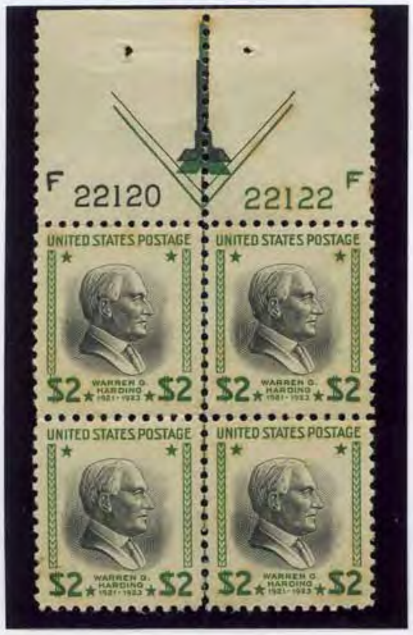


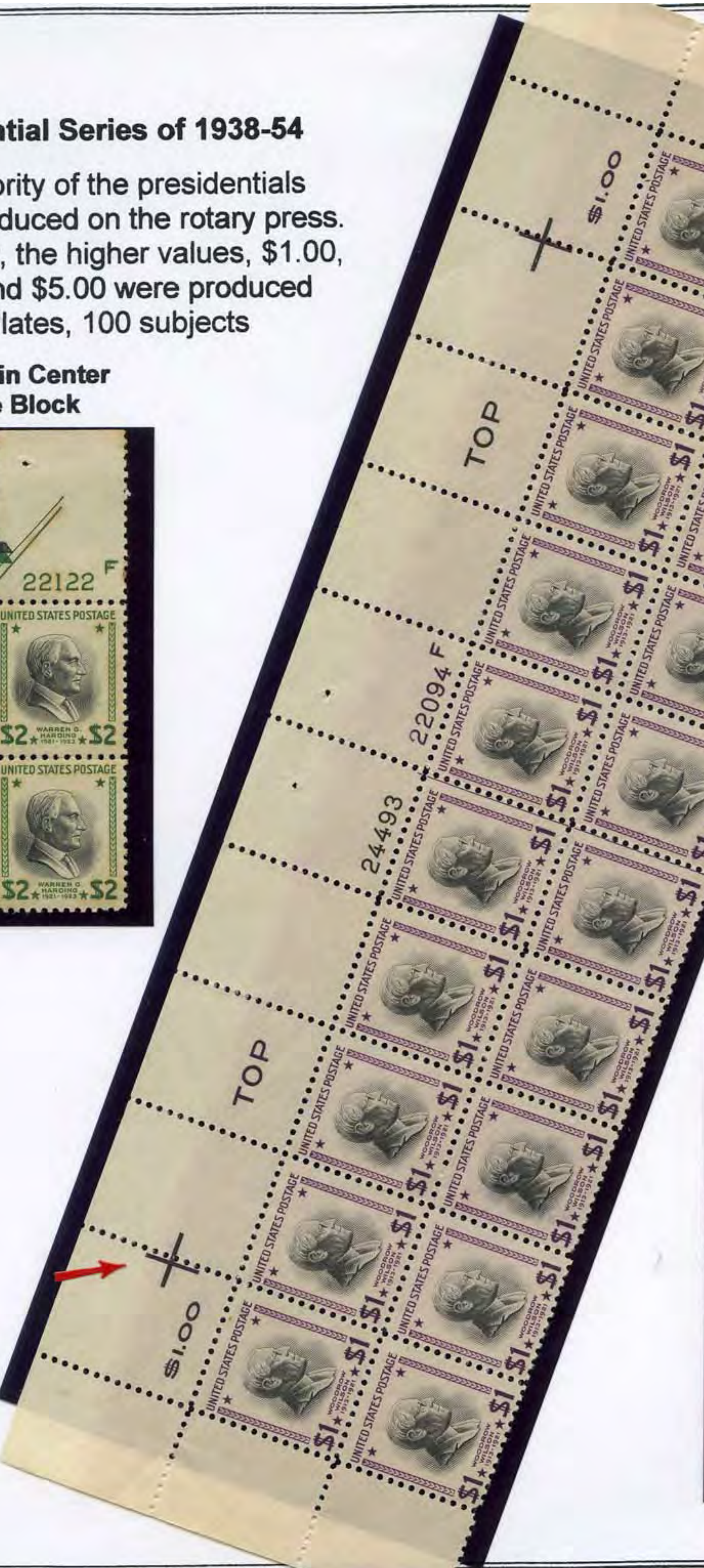
Fourth Bureau Issue, 1923-25

Presidential Series of 1938-54

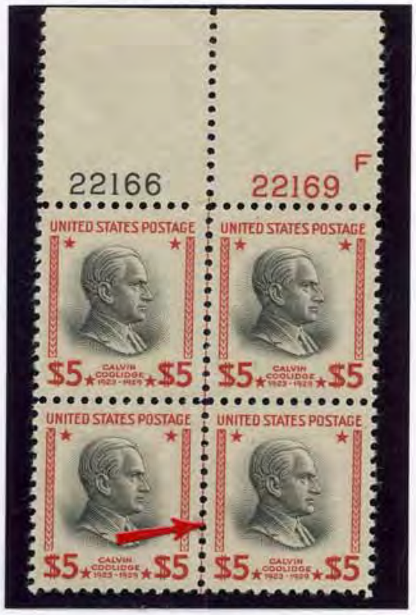
The majority of the presidentials were produced on the rotary press. However, the higher values, $1.00, $2.00, and $5.00 were produced on Flat Plates, 100 subjects

Top margin Center Line Plate Block





Top Margin Center Line Plate

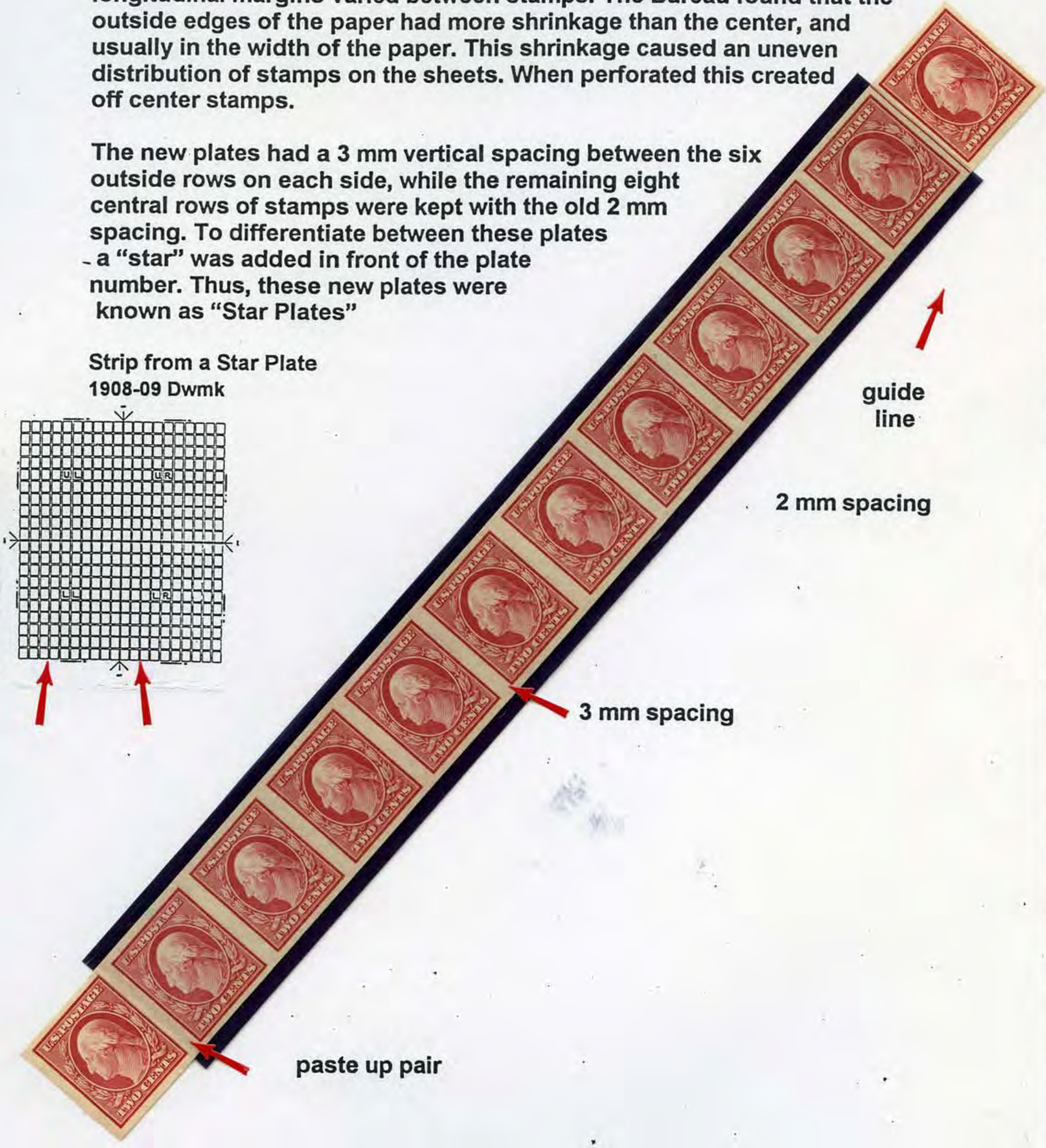


STAR PLATES (first used in 1909)
(uneven spacings of 3mm and 2mm)

In 1909 the Bureau decided to make a new type of plate in which the longitudinal margins varied between stamps. The Bureau found that the outside edges of the paper had more shrinkage than the center, and usually in the width of the paper. This shrinkage caused an uneven distribution of stamps on the sheets. When perforated this created off center stamps.

The new plates had a 3 mm vertical spacing between the six outside rows on each side, while the remaining eight central rows of stamps were kept with the old 2 mm spacing. To differentiate between these plates a "star" was added in front of the plate number. Thus, these new plates were known as "Star Plates"

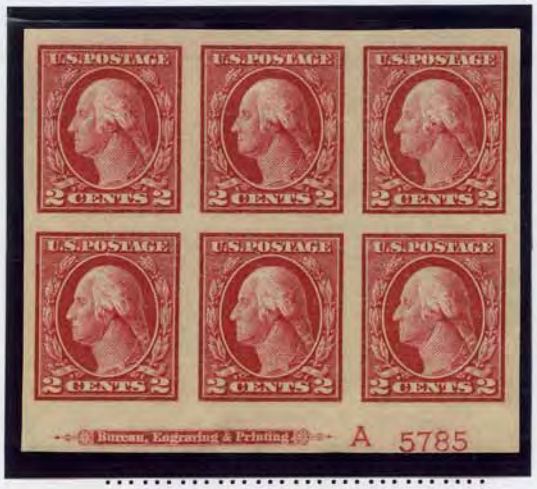
Strip from a Star Plate
1908-09 Dwmk

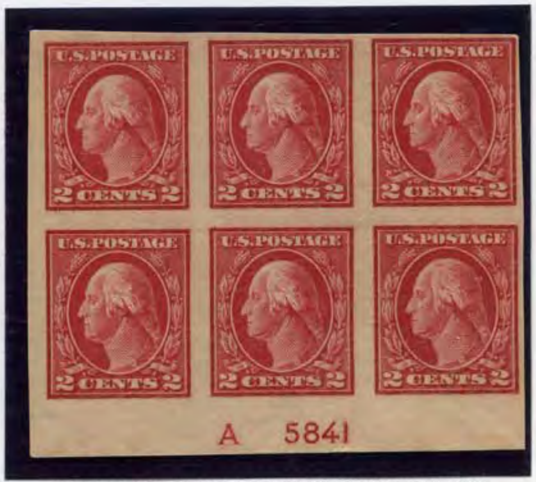


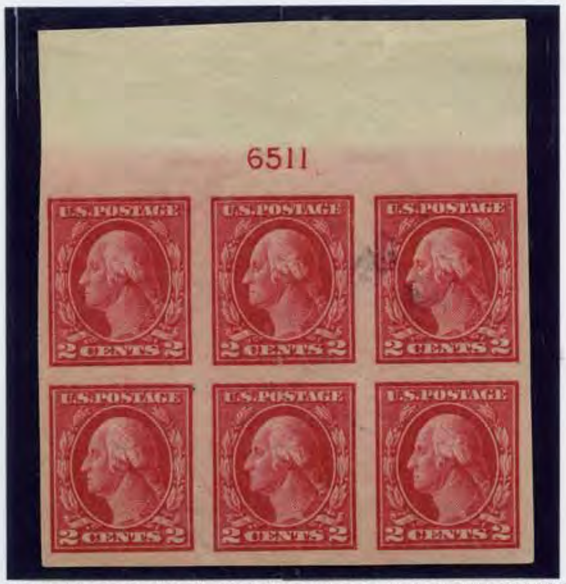
“A” PLATES; Even spacings of 2 ¾ mm (first used 1911)

In 1911 the Bureau again experimented with spacing between stamps to eliminate the waste caused by the shrinkage in the “wetting down” process. This time a uniform spacing of 2 ¾ mm was used. These plates were marked in the margins with the letter “A”. Either with an Imprint, “A” and Number or later with only “A” and Number, and finally the “A” was dropped altogether as the 2 ¾ mm spacing became the standard.

1912-14 Wmk Issue

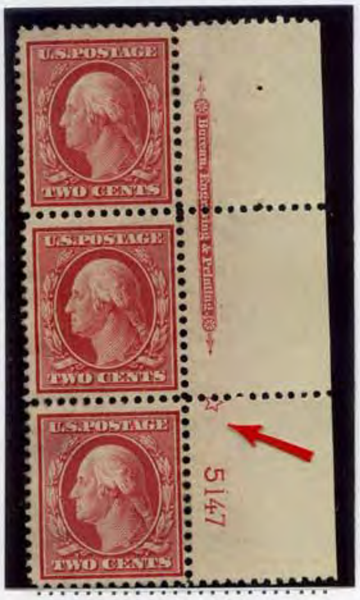






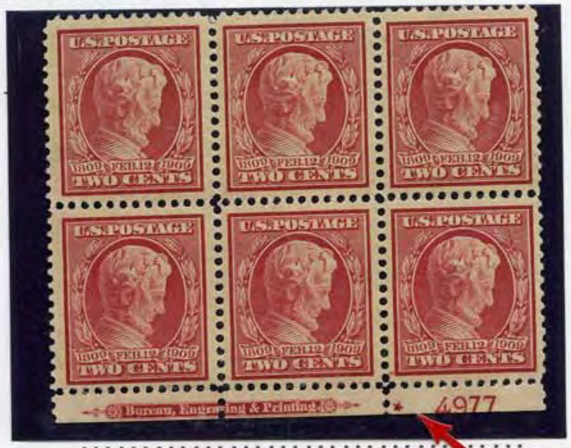
The Star Plates: two different types of Stars used

Examples:



Open Five Star

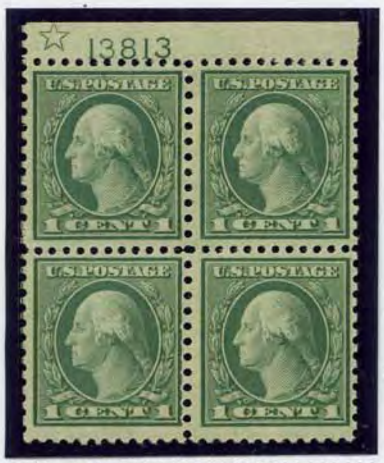
1908, perf 12,
Dwmk issue

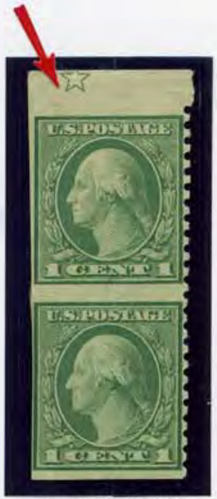


Small Solid Star

(also used on Plates #4980/4988 of 1c & 2c)
1908-9 Perf 12 issues)

Coil Waste Stars: Sometime later margin stars were used to identify sheets of coil production that were perforated to produce regular postage. Coil Waste to be demonstrated later in the exhibit.

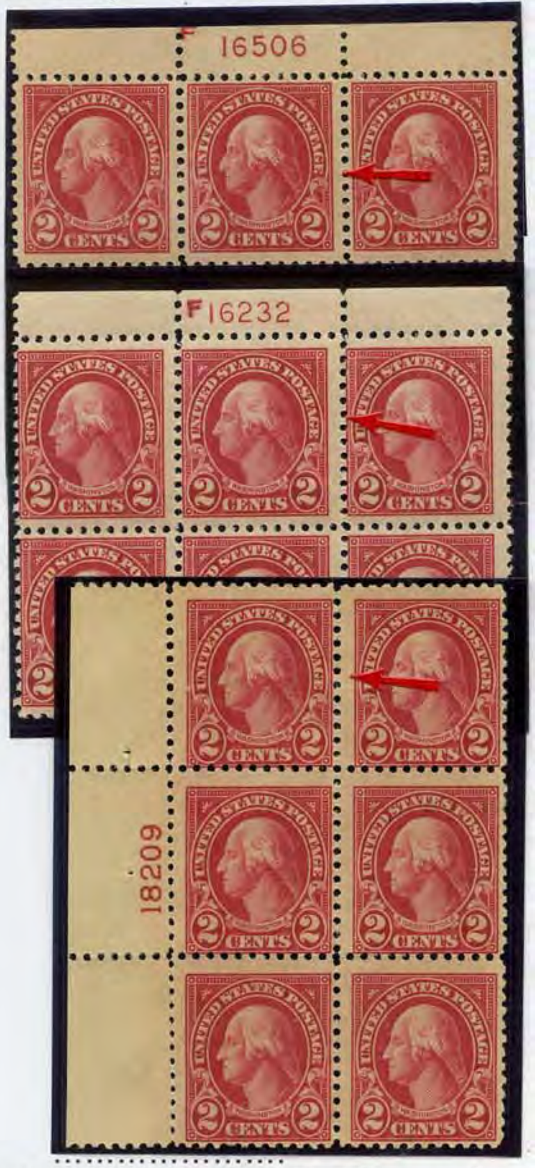




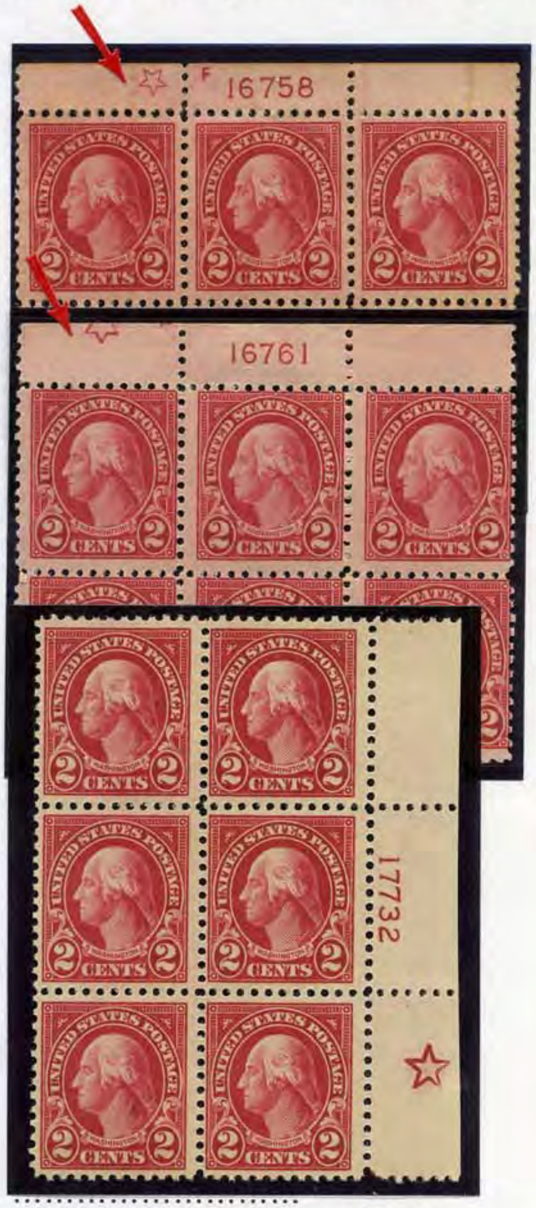
Perforation Error

Last spacing experiments with STAR PLATE MARKINGS-1922-26 Series

The Bureau commenced this series (the last Flat plate series) using 2 ¾ spacing, as on the "A" plates, just described. However, in 1925 they began to experiment with a slightly wider spacing (to reduce wastage) of 21.85cm from the center vertical line to the edge of the outside stamp. These were called "intermediate spacing". Then later, they went to a 22.0cm spacing or "wide spacing". The experimental intermediate plates (#s 16,505, 06, 07, 08) did not have star markings. The first "wide spacing" (16,656, 57, 58, 59) did not have stars, but most subsequent plates were marked with margin Star markings to alert the printers to use the correct perforators.



Narrow/Intermediate/Wide Spacings



Small five Star/Six Point Star/Large side Star

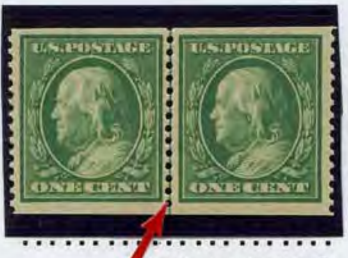
This series (principally the 2c Washington) had "an issue" of the "type" of star used and the positioning of the star. On one plate (#16,758) a "small, five point star" was used to the left of the upper plate number, then there were a few plates with the "six point star" to the left of the upper plate number, and then the "large star", at first by the upper plate number but later below the plate number on the upper right plane.

COIL STAMPS: Term Differences between Flat Plate and Rotary Press Printings.

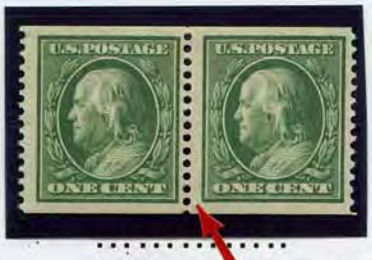
Coil stamps used in affixing or vending machines, began to be used in 1906-08. This necessitated the printing of imperforated sheets that were pasted together endwise or sidewise before being cut into strips and rolled for the machines. Private companies were the most aggressive users in the earlier years, buying imperforated sheets from the Bureau. Then the technically superior Stickney Rotary Press was developed improving the process. Imperf Flat Plate sheet production was continued for the private companies until 1926. (Examples of the various types of perforations used by the private companies are demonstrated later)

FLAT PLATE COIL TERMS

Guide Line Pairs/Spacings: Produced from Flat Plate press sheets of 400 stamps. A printers guide line appeared every 20 stamps (reference flat plate example).

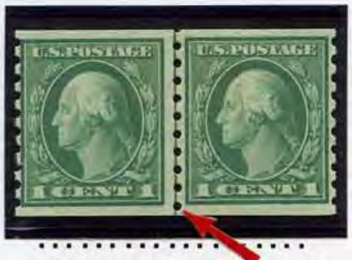


1910 perf 12 Swmk
2mm spacing



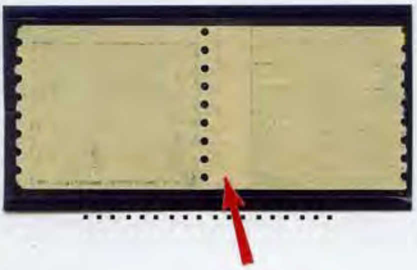
1909 perf 12 Dwmk
3mm spacing

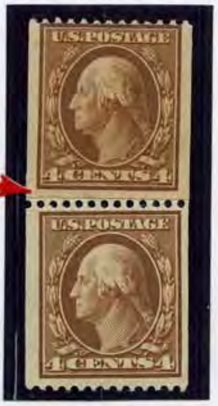
from "Early Star Plates"
Only 2mm spacings have line pairs



1914 perf 10 Swmk
2 3/4mm spacing
from "A" Plates

Paste up Pairs; As the strips were pasted together, to produce a roll for the machines, paste up pairs appeared every 20 stamps.

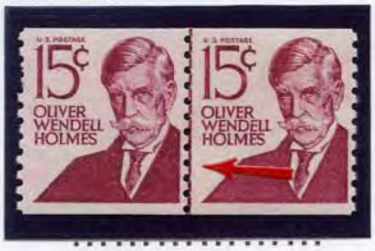




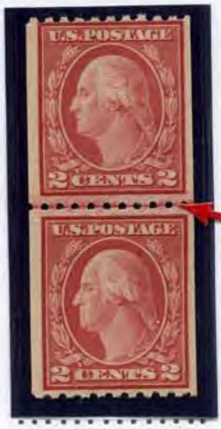
1908-10
Perf 12
Dwmk

ROTARY PRESS TERMS

Joint Line Pairs



1965 Issue



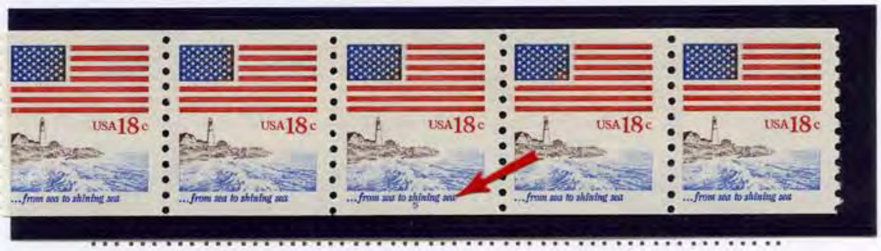
1916-19 perf 10 Uwmk

Rotary Press eliminated the pasting together of the strips that were required under the Flat Plate process. Printing cylinders were used to which the rotary plates were attached. The plates contained 170 or 150 prints. One term that developed out of this method was the "joint line pair".

The joint line pair differs from the Flat Plate guide line pair in that the line of color is caused by ink accumulating between the edges of the two semicircular plates, that are fitted around the cylinder. Joint line pairs appear every 17 or 15 stamps.

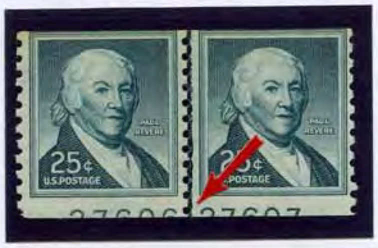
……

PLATE NUMBER COIL STAMPS


USA 18c
...from sea to shining sea
USA 18c
...from sea to shining sea
USA 18c
...from sea to shining sea
USA 18c
...from sea to shining sea
USA 18c
...from sea to shining sea

In 1981 the Bureau began including the plate number on the bottom of the stamp design, thus creating a plate number coil. The first of these was the 18c Flag coil, issued 1981. With this development, a new category was created for collectors.

The below item of the 1958 Liberty Issue, 25c Paul Revere, is of interest as it has partial plate #s: 27606 and 27607



ROTARY PRESS PRINTING: Die Differences

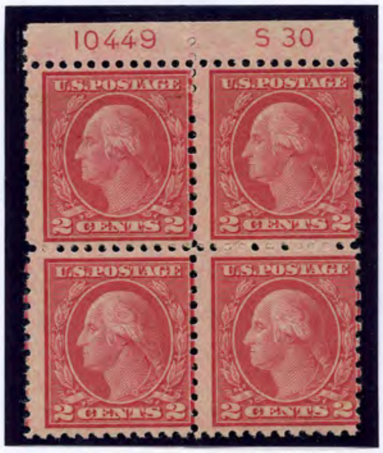
The Type I die used for the Flat Plate 2c Washington issues proved unserviceable for the Rotary Press printings.

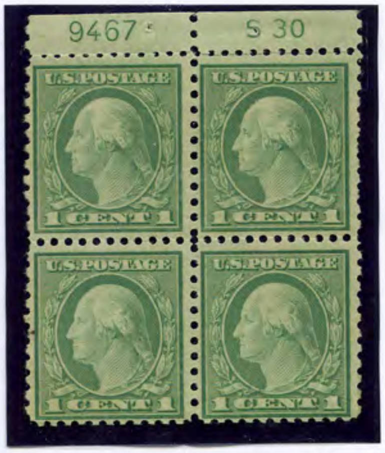
"S20" & "S30" Dies (Type II & III of the 2c Washington Issue)

The Bureau first attempted to use the then current Die I Type of the 2c Washington issue, but it was discovered that the character of the frame engraving was such that it produced smudgy prints due to excess ink, when curved for rotary printing. To overcome this difficulty a new die, Type II, was made from a relief of Type I on which the frame line characteristics were altered so that the inking difficulties would be overcome. These Die II Types were marked "S20". Another experiment from the Die II was created but had a deficiency of ink. These were marked "S40". It was determined to develop a new die, which had the frame lines engraved in an entirely different style. This was Type III and these were marked "S30".

1c & 2c 1919 coil waste 10x10

Example of "S" Marking on this "coil waste" block. Coil waste demonstrated later



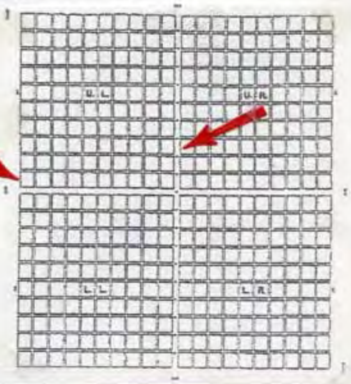


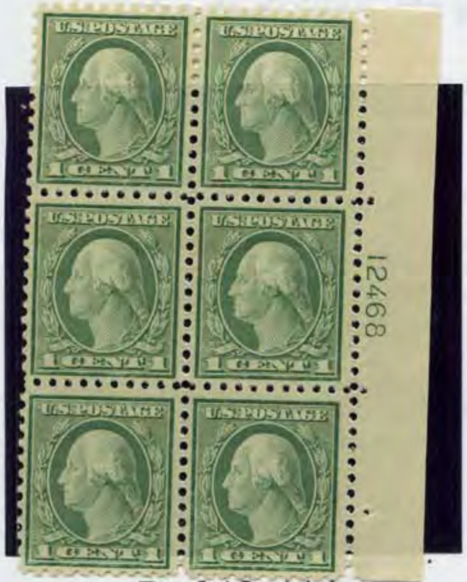
As with all coil sheets, the margin markings were usually cut off so the "S" markings would not have appeared before the public except that some of these sheets were later used as regular postage by having the short coil sheets perforated, producing "Coil Waste" issues. In these cases the "S" markings in the selvage were retained: The S20 marking appearing on the type II 1919 issue: the S30 marking on the 1919 1c coil issue, the type III 2c issue, and the two coil waste issues of 1921. The "S40" marking never appeared as this Type proved unsatisfactory.

EXPERIMENTAL ROTARY PRESS PRINTINGS FOR SHEET STAMPS

In 1920 it was decided to create plates for rotary press sheet stamps. Plates of 400 subjects were produced that were divided into four panes by horizontal and vertical spaces between the stamps, in place of guidelines. Some with perforation hyphens, some without.

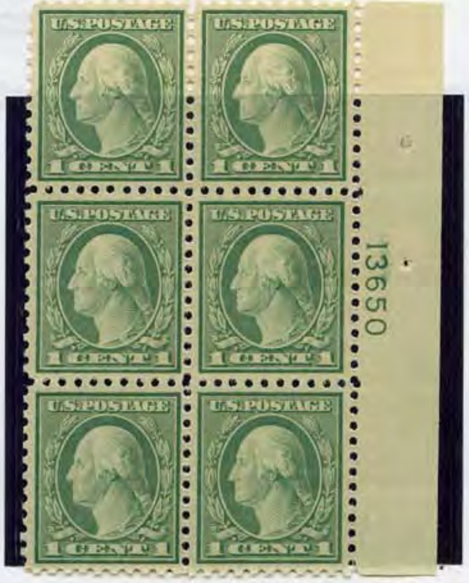
The plates were used on the 1c 1920 perf 10x11issue and 1921 perf 10 issue. The first issue had the plate numbers on the side of the plates. The second issue was perforated 10x10, as it was determined that the 11 perf of the previous issue created brittle sheets, as the sheets divided into vertical strips.

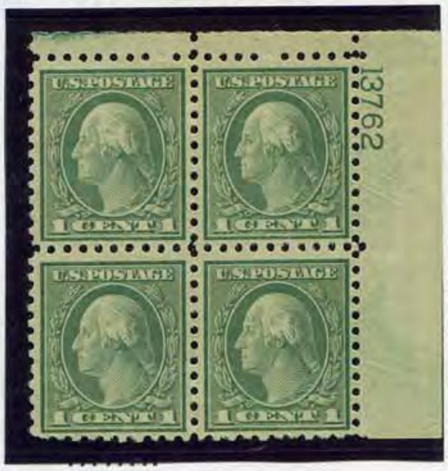




Perf 10x11 Issue

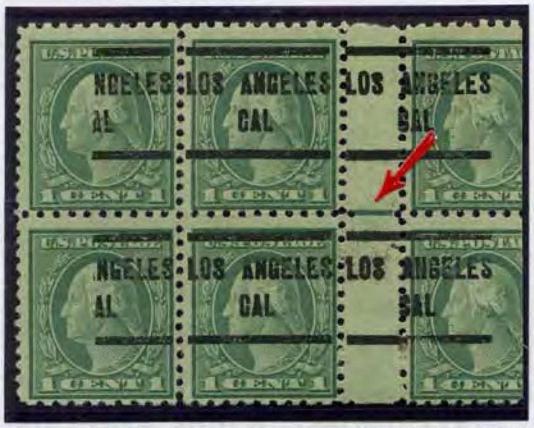
Plate # on side





Perf 10x10 Issue

Plate #s for the first 7 plates were on the side as the case with 10x11 but the remaining plates had the #s on top right & lower left sides



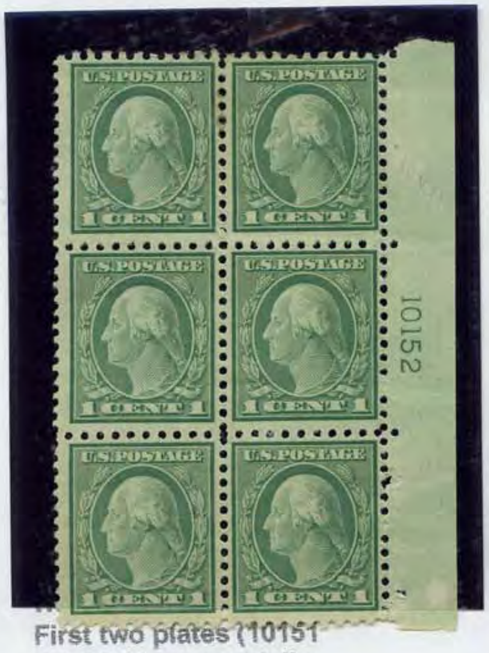
Example of "hyphen" between"

Regular Rotary Press sheet stamps did not appear in quantity until 1923 and 1924, with 4th Bureau 11x10 1/2 issues.

ROTARY SHEET PRODUCTION CREATES SHEET CURL PROBLEM

With the first production of rotary sheet stamps the postal service received complaints about sheets curling. To minimize the problem the Bureau began to experiment with Gum Breakers. Rollers that were mounted on the perforation machines.

1919 First rotary sheet stamps (Perf 10 x 11)



First two plates (10151 & 10152) were initially without gum breakers *

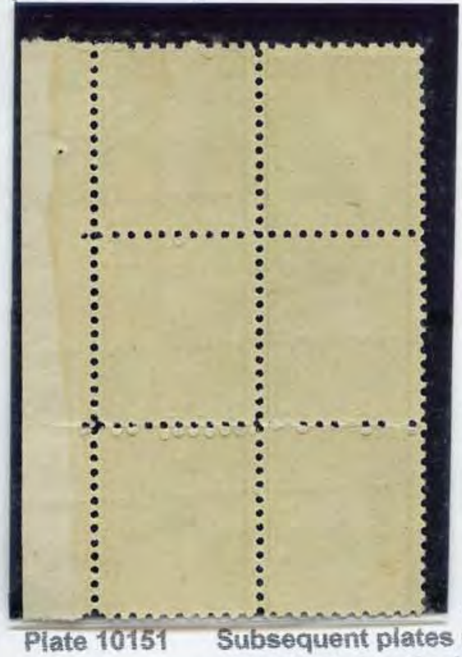
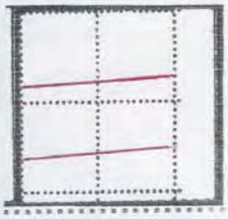


Plate 10151

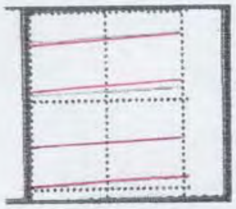


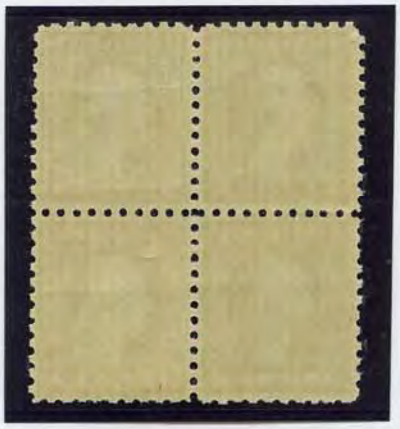
Subsequent plates used one breaker that slanted to the left at 4 degrees. Breakers being 20 mm apart

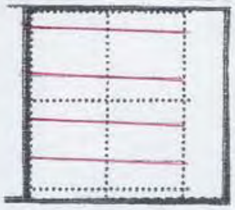
* However, experimentation was started on gum breaks and later printings of these plates had breaks as shown above.

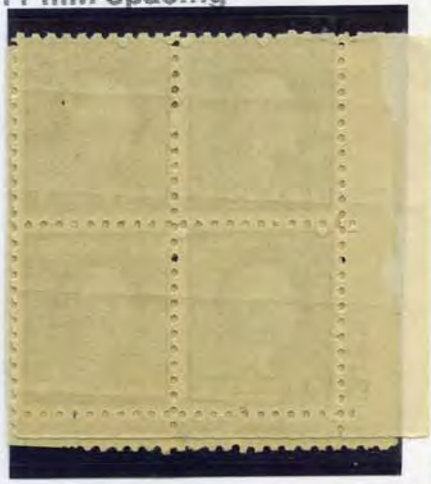
The Second rotary sheet stamp, 1920 was perf 10x10, as the 1st rotary issue had curl complaints and also separation complaints with the 11 perf)

1) 1st issues breaker as above
2) later issues with two breakers slanting left or right with 11 mm spacing

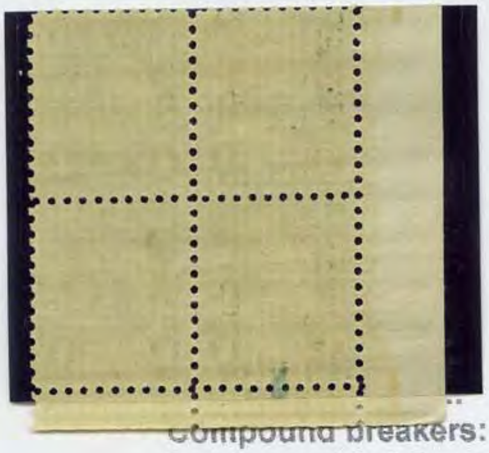


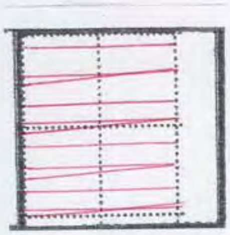




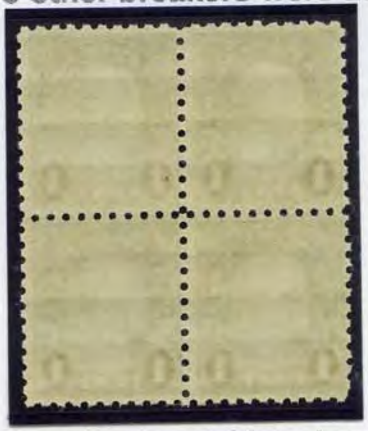


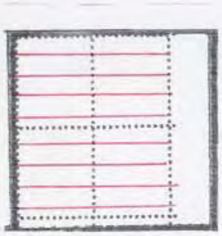
The 1923 1c Franklin (perf 10 x 10) initially had one of the two types of breakers used on the 1921 stamps. Later, two other breakers were used.





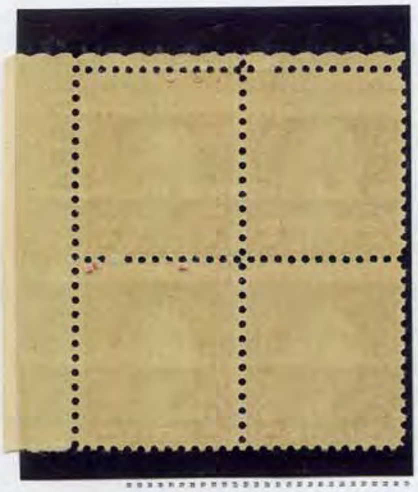
Compound breakers: horizontal breakers with 5.5 mm spacing superimposed on 2 diagonal breakers

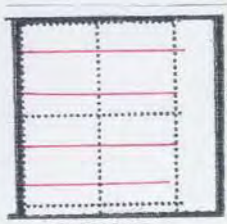




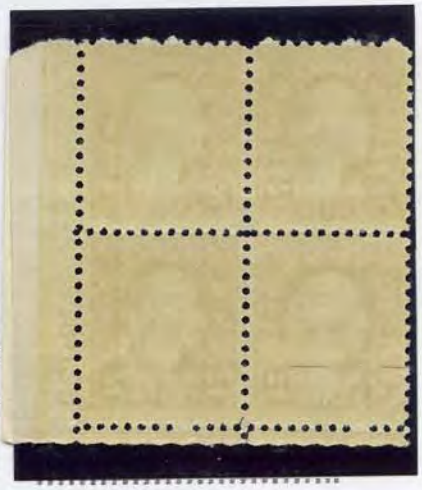
Four horizontal breakers with 5.5 mm spacing

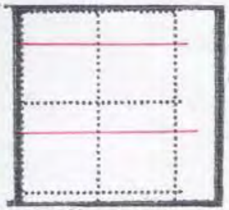
The 1926 2c Washington (perf 11x10 ½) had three other experimental breakers. Two horizontal breakers with 11 mm spacing; one breaker with 22 mm spacing; and a third with 8 horizontal breakers at 2.75 mm spacing





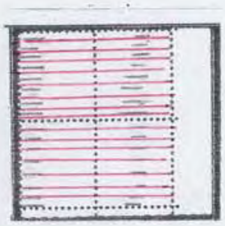
Two horizontal breakers
With 11 mm spacing



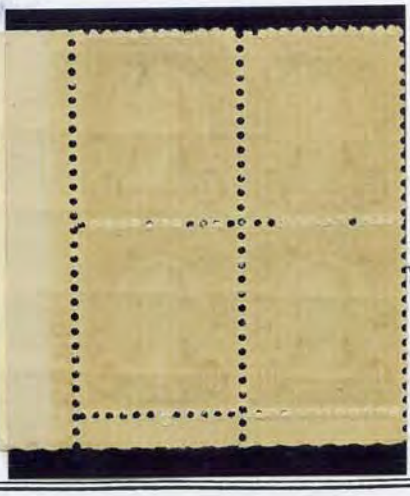


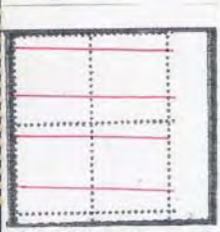
One breaker
22 mm spacing

8 horizontal breakers
2.75 mm spacing



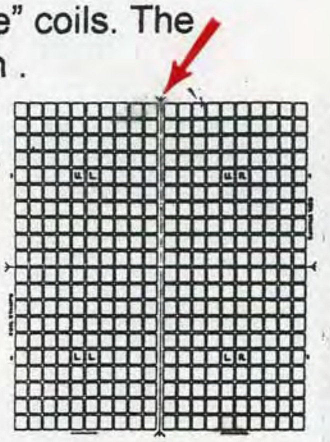
In 1931 BEP reverted back to two breaker diagonal bars slanting right. Spacing was 10.5 mm. This became the standard

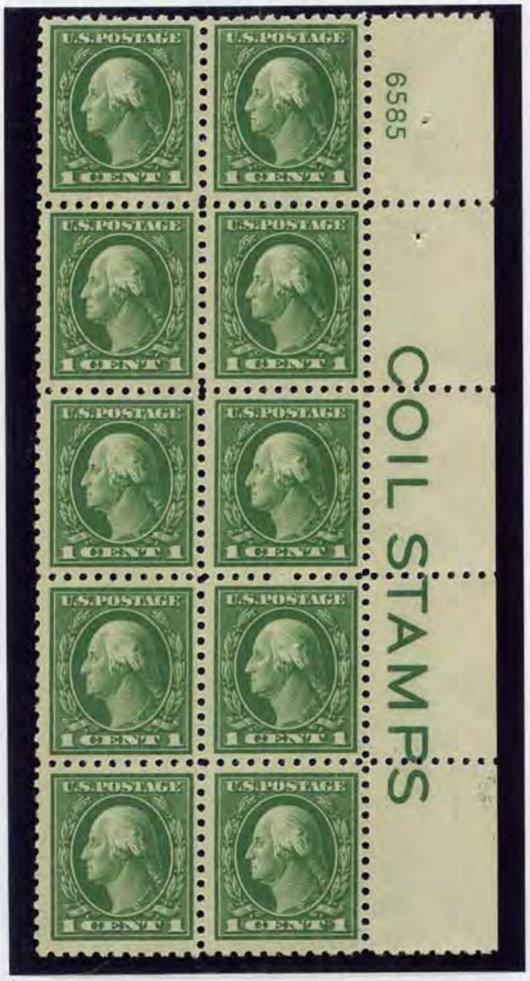


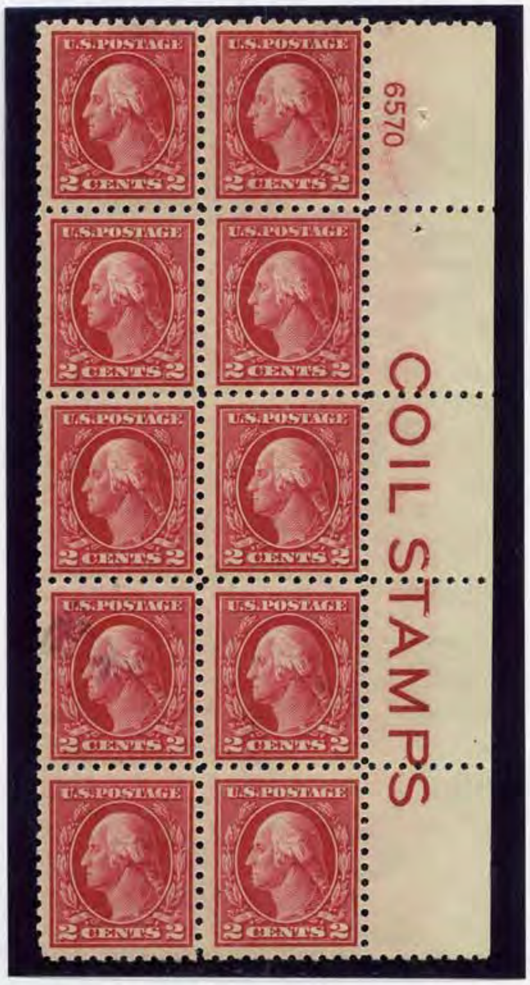


“COIL STAMPS” PLATES

Special Plates were created for the production of “Endwise” coils. The plates were first used in 1912 for the 1c green Washington . The plates had an additional 1cm between the tenth and eleventh vertical rows to facilitate the cutting of the sheets in half to produce endwise coils. This accommodated a new processing technique in which the sheet was cut in half (creating 200 stamps 10x20), which in turn were pasted together and then fed into the machine to be cut into strips. In the cases below the sheets were perforated in both directions, producing regular sheet stamps.







MODERN PRESSES

The following are two examples of more modern presses.

In 1950 the Bureau experimented with a newer rotary press, the Huck press. The Huck press was much faster than the Stickney press, that was in use at the time. The Bureau experimented with this press for four years before using it on the Liberty Series of 1954.

Then another press in 1970, the Andreotti press. The Andreotti press used a photogravure process.

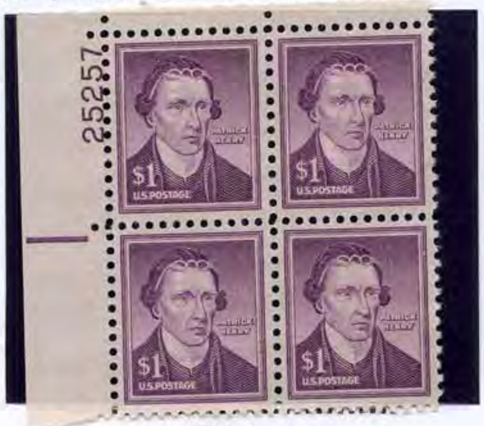
WET/DRY PRINTING METHODS

WET PRINTING METHOD ON THE STICKLEY PRESS

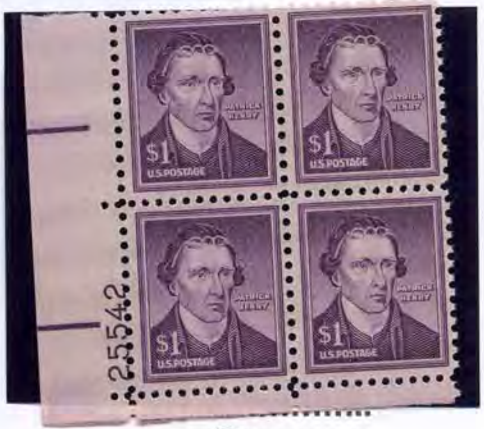
The Bureau traditionally printed postage stamps by the wet method. Paper with approximately 18% moisture content was used and more water was added at the press.

DRY METHOD ON THE HUCK AND COTTRELL PRESSES

In June 1950, the Bureau received an experimental rotary press, the Huck press. The production rate of this press was about three times greater than the Stickney press. After four years of experimentation the Bureau came up with a wholly new printing process using dry paper (about 5% moisture) without adding water. The dry paper required greater pressures to force the paper into the plate recesses to pick up the ink and in turn required new impression roils, which were covered with laminated paper that handled the increased pressure better than regular steel rolls. There are stamps of both wet and dry varieties in the Liberty Series, Postage Due, Airmails, and even the $1.00 Presidential Issue.



Wet



Dry

Differences

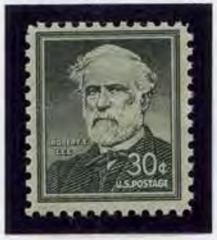
1) The rotary press types have different papers
  a) The Wet papers have rougher surfaces than the Dry
  b) The Dry papers are glossier
  c) Dry papers are thicker and more opaque. Therefore the printed image is more visible on the reserve side
  d) Dry papers are whiter
2) Gumming differences
  Rotary types have an area in the selvedge that is gum free
3) The gum on the Wet types is darker than the Dry types which appears very white
4) Electric Eye markings
  a) Wet types have the selvedge bar markings only on the left hand margins and the bars are opposite the top frame line of the adjacent stamp design
  b) Dry types have bar markings on both the left and right sheet margins and the bars are located nearly opposite the center of the adjacent stamp
5) Flat press types have the same differences of paper thickness, color, gum colors, and gum colors, and gum differences in the selvedge as the rotary.

6) Flat press types permitted the use of pre-gummed papers.
7) Dry types should be free of offset ink on the back side. The Wet stamps may have this ink on the back side as the sheets were stacked after printing and some offset ink bleeds into the back of the upper sheet. Because the Dry types were pre-gummed this did not take place.

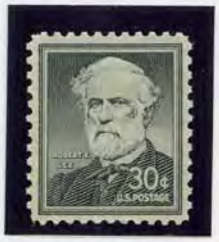
EXAMPLES OF THE DIFFERENCES

1) Gloss appearance of the Dry type. Also a difference in color with the Dry stamp being brighter.

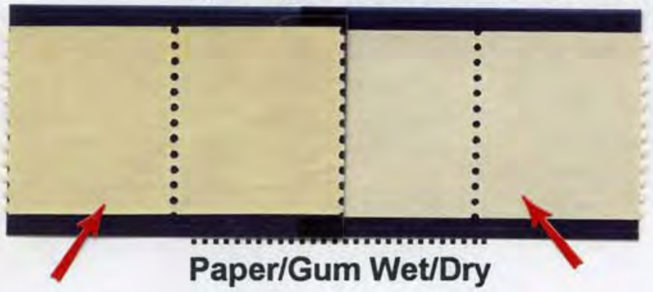
Wet



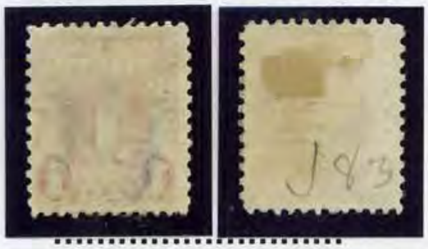
Dry



2) Color of papers and gums. The Dry type being the whiter of the two
3) Paper thickness, with the Dry types being thicker & more opaque.



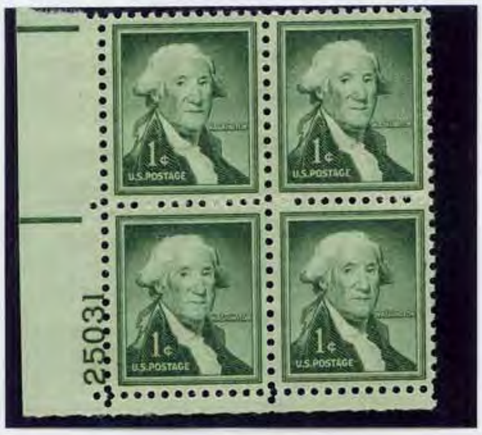
Paper/Gum Wet/Dry



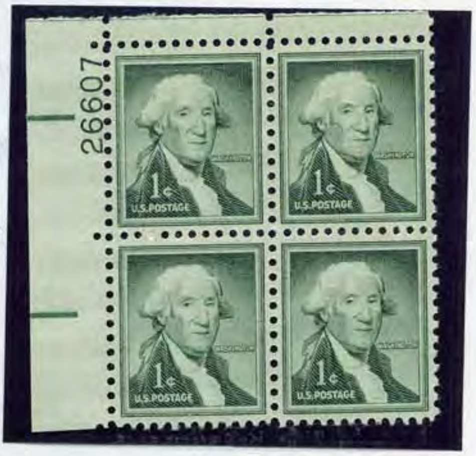
Paper thickness Wet/Dry

1) Electric Eye Markings: The bar markings in the selvedge on the Wet types are always opposite the top frame line of the adjacent stamp. On the Dry types the bar lines are opposite the middle of the adjacent stamp.

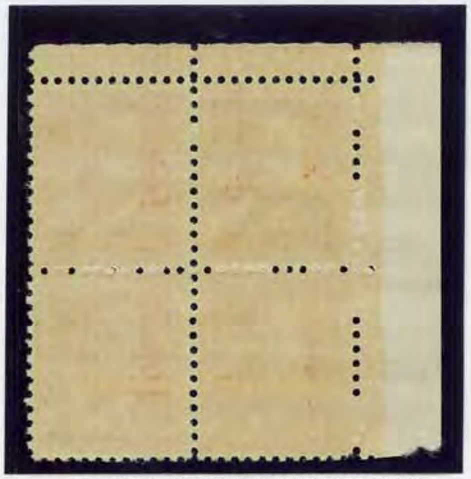
Wet



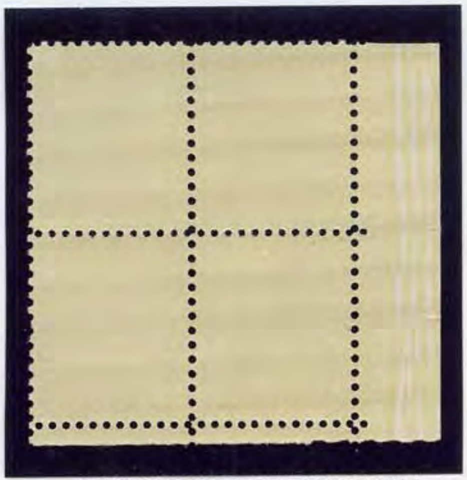
Dry



5) Gum Difference in selvedge. In the Wet type there is not any gum on approximately a quarter inch of the selvedge. In the Dry type the gum extends to the edge although it does get irregular towards the edge of the selvedge.



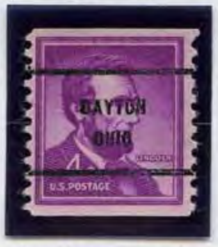
Wet

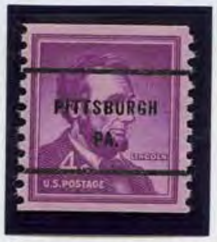


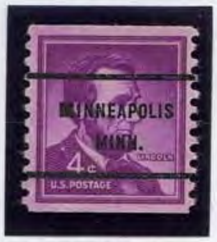
Dry

4c Issue: Found only in Pre-canceled form

It is also interesting to note that the 4c was only printed in a pre-canceled form. It has been found pre-canceled from the following cities: Brooklyn, Chicago, Cleveland, Dallas, Dayton, Des Moines, Detroit, Kansas City, Long Beach, Los Angeles, Minneapolis, New York, Omaha, Pittsburgh, Portland, St. Louis, Toledo.

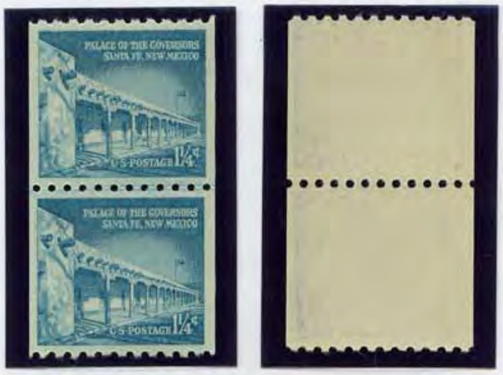




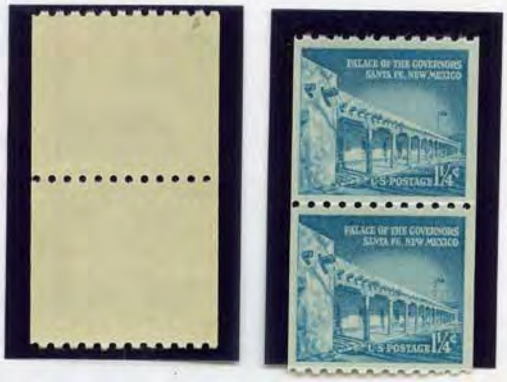


The Liberty Series challenges in other ways. During the history of the issue a new perforating machine was used for the coil issues. As a result some of the coils were produced with different size perforations.

Large Holes

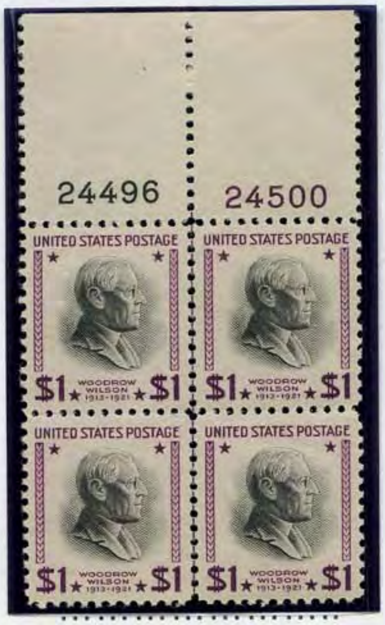


Small Holes

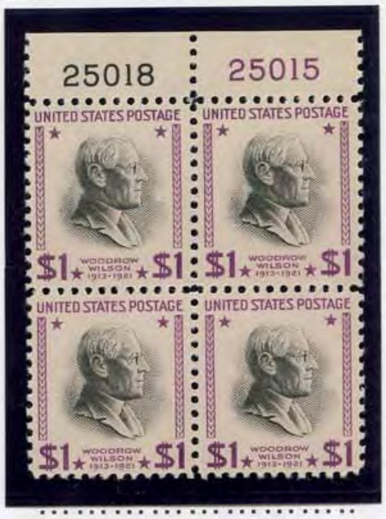


Presidential Series

The $1.00 Wilson issue of the Presidential Series was the first issue recognized in catalogs for the difference in “Wet” and “Dry” printing.

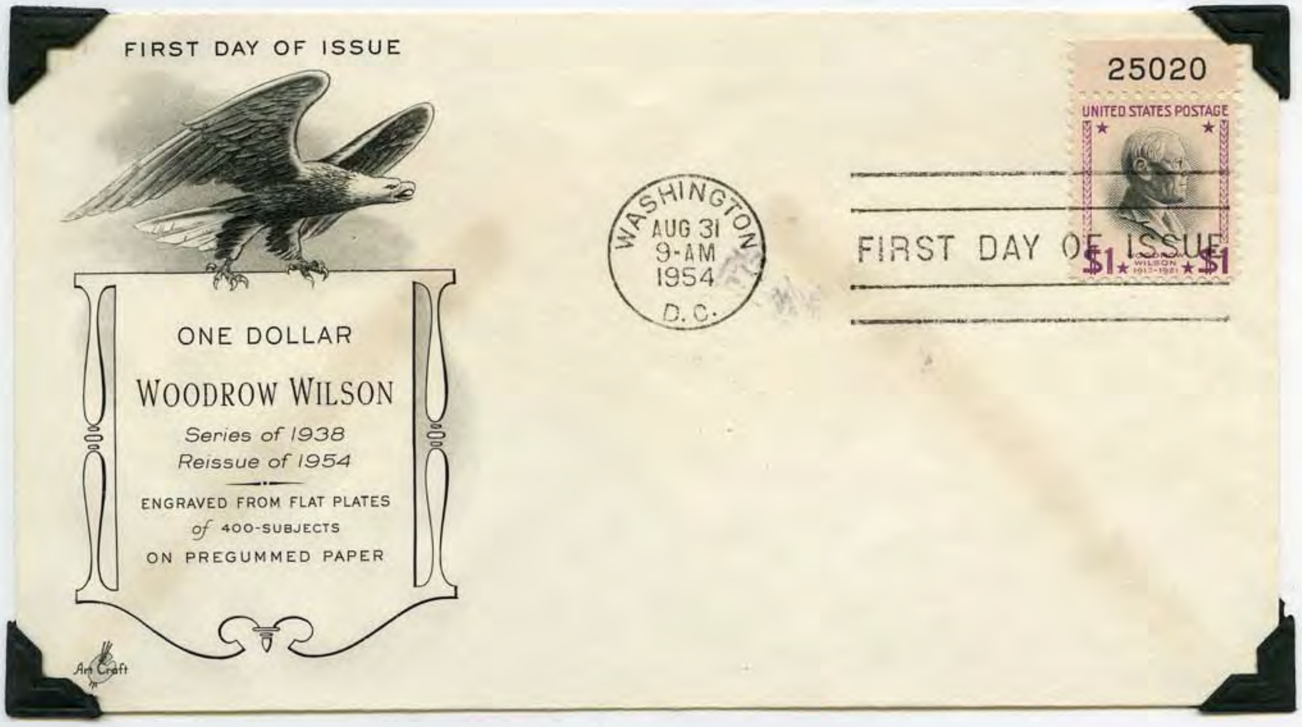


Wet



Dry

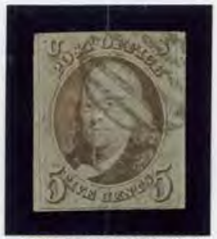
This issue is also the only “dry” issue that was recognized by a first day issue.



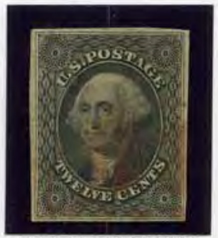
PERFORATIONS

The first perforated stamps were delivered to the government in early 1857. Toppan, Carpenter & Co. ordered perforating machines from the firm of Wm. Bemrose & Sons, of Derby, England. Of interest the machines were first tested for rouletting but changed over to perforations. The catalog will always indicate whether the issues were perforated or issued Imperforated. Perforations can give one an idea of the general date of issue. Perforations are always read from the top of the stamp and then to the right hand side of the stamp.

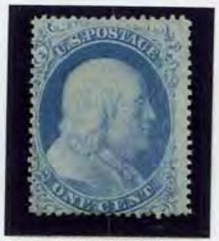
Imperforated (1847-1857)



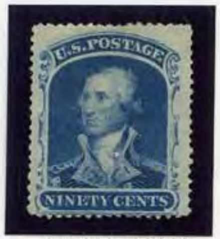
1847-1857



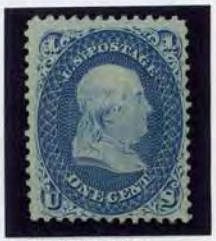
Perforated 15 ½ (1857-61)



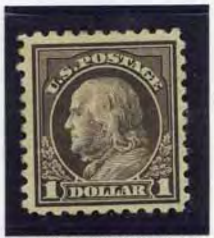
1857-61



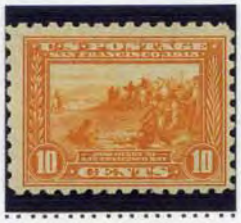
Perforated 12 (1861-1913)

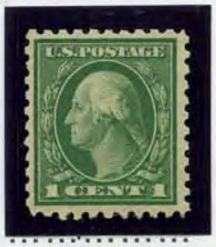


1861-1913



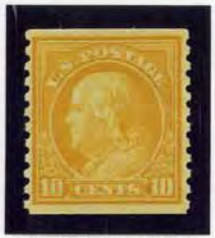
Perforated 10 (1914-1917). These were essentially the Washington/Franklin series but also included the Panama/Pacific Exposition





Perf 10 Swmk

1914-1917



Perf 10 Rotary

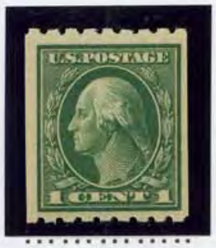
Perforation 11 (1917-the early 20s)

An experiment with the perf 11 was tried in 1915 with Flat Plate 2c and it was introduced two years later in 1917.

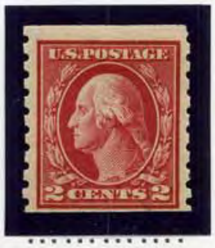
Then there were the experiments and exceptions

In the early 1900s vending companies were having difficulty with the Perf 12 stamps breaking off too easily. As a result, the Bureau experimented with a 8 ½ perf. for coils.

Perforation 8 ½ (1910-1914)



1912-1914

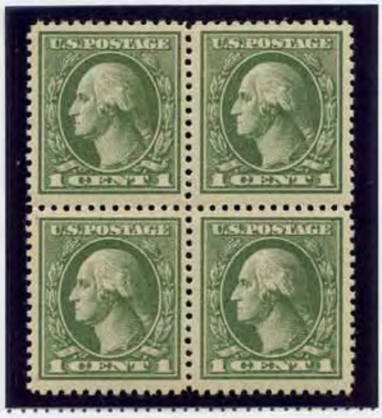


This experiment proved too extreme, so the compromise perf 10 (demonstrated above) was used.

1919 Rosback Perforating Experiment

Perforation 12 1/2

When Offset Printing, which was a much faster process, began to be used, the Bureau experimented with the Rosback Perforator, because it had the potential of keeping up with printing speeds. The perforation was 12 ½. This proved unsuccessful as approximately half of the sheets were destroyed because of perforation spoilage.



From 1923 forward perforation combinations were11 x10 ½ , 11 x 11, 10 x 10. More recently, 1990s technology has produced perforations to numerous dimensions.

A modern day exception was the Thomas Eakins issue of 1967, that was perforated 12 x 12. As demonstrated earlier, this was only the second issue (first being the Overrun Countries) to be printed by a private company after 1894.